



## Working Paper 9

# Low Government Revenue from the Mining Sector in Zambia and Tanzania: Fiscal Design, Technical Capacity or Political Will?

Olav Lundstøl, Gaël Raballand and Fuvya Nyirongo

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# Low Government Revenue from the Mining Sector in Zambia and Tanzania: Fiscal Design, Technical Capacity or Political Will? <sup>1</sup>

Olav Lundstøl, Gaël Raballand and Fuvya Nyirongo

## Summary

The contribution of mining to economic and social development in Sub-Saharan Africa is under increased scrutiny and criticism. Minerals are non-renewable resources, and production represents a transformation from a subsoil to a financial asset. Unless the gains are efficiently captured, saved and invested by the ultimate owner of the resource, the country in question could experience a net reduction in its national wealth.

Preliminary empirical evidence indicates that effective benefit-sharing in mining has been notoriously difficult to achieve. In this paper, we present a simple method to benchmark the degree of revenue-sharing in some major mining countries. This is utilised to estimate the amount of mining revenue foregone due to ineffective mining revenue-sharing in our case countries of Tanzania and Zambia during the period 1998-2011. Using company-level data from the recently published Extractive Industries Transparency Initiative (EITI) reports in the two countries, we find that profit-based corporate tax made a very modest contribution to mining revenue, despite 5-10 years of operations under the current owners and a global mineral super cycle since 2005/6 (TEITI 2011; TEITI 2012; ZEITI 2011; ZEITI 2012). Gross value-based corporate taxes, together with employee-based taxes, dominate the tax revenue collected from the mining sector.

The principal elements needed to secure improved revenue-sharing in mining are: i) robust fiscal design, including a progressive element to capture windfalls while encouraging cost-saving and production; ii) specialised tax administration for extractive industries and mining, to minimise the erosion of the tax base and to establish and enforce correct tax assessments; and iii) political will and accountability, together with government consistency, in order to secure the expected tax collection from mineral extraction over time with increased transparency of mining-related revenues.

**Keywords:** mining, taxation, Africa, Zambia, Tanzania, EITI.

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<sup>1</sup>

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# Acronyms

ASYCUDA	Automated System for Customs Data
BOZ	Bank of Zambia
BSAC	British South African Company
CIT	Corporate Income Tax
CODELCO	Corporacion Nacional del Cobre
CSO	Central Statistical Office
DEBSWANA	De Beers Botswana Mining Company <sup>2</sup>
DR	Domestic Revenue
DRC	Democratic Republic of the Congo
EITI	Extractive Industries Transparency Initiative
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National Income
GRZ	Government of the Republic of Zambia
IMF	International Monetary Fund
ICTD	International Centre for Tax and Development
KCM	Konkola Copper Mine
LME	London Metal Exchange
MDA	Mining Development Agreement
MEM	Ministry of Energy and Minerals
NFC	NFC Africa Ltd (owns Chambishi Mine)
NNI	Net National Income
NSSF	National Social Security Fund
PAYE	Pay As You Earn
PPF	Public Pension Fund
PwC	PriceWaterhouseCooper
SSA	Sub Saharan Africa
STAMICO	State Mining Company Ltd
TEITI	Tanzania Extractive Industry Transparency Initiative
TMAA	Tanzania Mineral Audit Agency
USD	US Dollar
VAT	Value Added Tax
WHT	Withholding Tax
ZCCM	Zambia Consolidated Copper Mines Ltd.
ZCCM-IH	Zambia Consolidated Copper Mines – Investment Holdings Plc
ZEITI	Zambia Extractive Industry Transparency Initiative
ZMK	Zambian Kwacha
ZRA	Zambia Revenue Authority

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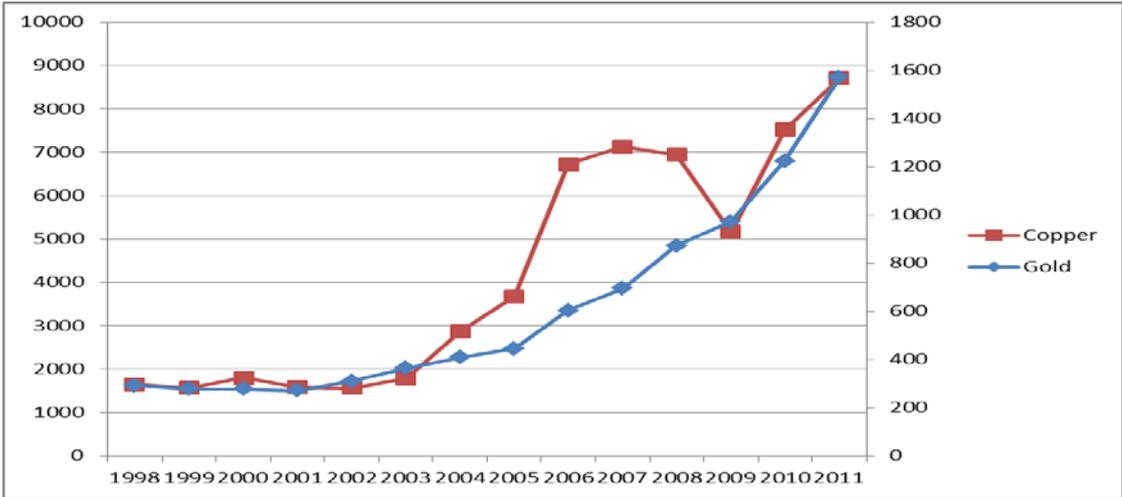
<sup>2</sup>

This was the original name when the company was formed in 1969. The Government of Botswana initially had a 15 per cent share but increased this to 50 per cent by 1974. In 1991 it changed its official name to Debswana Diamond Company Ltd., and moved its headquarters to Gaborone.

# Introduction

The developing world, and Africa in particular, is witnessing a renewed global race for its mineral resources. Graph 1 shows how the price of these commodities has been increasing rapidly over the last decade.

**Graph 1: Average global copper and gold prices 1998-2011**



Source: COCHILCO (2012). The left vertical axis shows current copper prices in USD per ton; the right vertical axis shows current gold prices in USD per troy ounce.

There has been a very strong but somewhat delayed investment response to the large increase in global prices so far. Global investment in mining and metals increased from a relatively static low of around USD 20-30 billion 1978-2003, up to USD 90-110 billion in recent years (adjusted to 2011 USD prices) (Humphreys 2011).

The increase in gold and copper prices reflects an overall global turnaround after several decades of relatively low mineral prices. Over the last decade this has completely changed the profitability of the global and local mining industry, and the viability of expanding both existing and greenfield development projects. This is reflected in the 2011 report on mining from PriceWaterhouseCoopers (PwC 2011). This reports that the top 40 mining companies in the world have increased revenue by 32 per cent, exceeding USD 400 billion for the first time. Net profits have increased by 156 per cent, up to USD 110 billion, and total confirmed assets are worth close to USD 1 trillion.

The changes observed in the mining sector over the last decade could represent the start of a major shift in how mining activity is managed at both national and company levels. Many observers, industry specialists and academics expect that fundamentally different real price levels are here to stay for a prolonged period. This is because we seem to be experiencing the early to mid-phase of what has been called the fourth super cycle of mineral prices (there have been three other super cycles for key minerals at a global level in the last 150 years). Such cycles have on average lasted 10-35 years, and Chinese urbanisation and industrialisation are believed to be mainly driving the current one (Cuddington and Jerrett 2008).

In 2008, Sub-Saharan Africa already accounted for a large share of global mine production of key minerals such as diamonds (54 per cent), cobalt (55 per cent), platinum (63 per cent),

gold (20 per cent) and chromites (46 per cent), as well as a smaller but growing share of other minerals and energy commodities such as bauxite, copper, nickel, coal, oil and natural gas (Sturmer 2010). It is, however, likely that Africa, and in particular Sub Saharan Africa (SSA), is one of the most unexplored inhabited regions of the world today in terms of its mineral potential and wealth. Paul Collier estimates that the known value of subsoil assets in Africa is still only one-fifth per km<sup>2</sup> that of the rich world (Collier 2010). This is very unlikely to reflect inherently low subsoil assets. There continues to be serious doubt as to how well prepared the poor but resource-rich countries in SSA are to take advantage of this renewed opportunity. Some of this concern relates to how the mining industry is currently regulated in these countries.

With the wave of privatisation in Africa in the 1990s, the mining industry increasingly returned to international ownership (as it had been prior to independence in many countries). New legislative and contract terms were instrumental in bringing back much-needed modernisation and investment. The price outlook, however, remained relatively low up to 2004/5, and several of the early entrants (or re-entrants in some cases, as several had been involved in the same mines before nationalisation) ended up withdrawing with significant losses.<sup>3</sup>

As a consequence of the modest outlook for the mining industry, and its economic, social and political significance in many developing countries, many fiscal regimes and the inherent benefit-sharing formulas established in mining development agreements (MDAs) were tailored towards securing investment and protecting against the downside. These often had long-term fiscal stabilisation clauses. As global prices started to turn around dramatically after 2004/5, there was initially a very slow reaction and/or willingness to accept that fundamentals were changing in the mining industry, and that new regulatory regimes were called for to secure effective benefit-sharing between companies and the government.

The prevailing argument remained the need to improve the investment climate and uphold the principle of sanctity of contract. This followed some decades of turbulent nationalization. The push for liberalisation and privatisation did, admittedly, contribute to a new era of growth in Africa. This was, however, felt to be a fragile change, and the threat of international companies exiting if fiscal terms were changed, and uncertainty in future prices, contributed to few changes in the regulatory regimes of mining before 2007/8. A further inherent sentiment could have been the fact that, for minerals such as copper, the strong real price increase from 2004/5 represented a form of compensation for three decades of low prices.<sup>4</sup> The high mineral rent from 2004/5 onwards could be justified as a sort of 'quasi rent', since it compensated for earlier low prices.<sup>5</sup> The problem with this argument is that the privatisation process in many mineral-rich countries in SSA, and specifically in Zambia and Tanzania in the early 2000s, brought about a broad change of ownership, so the rent associated with the price increase from 2004/5 to a large extent represented a real rent increase for the largely new foreign owners.

Gradually a broader social and political scrutiny emerged, together with an incipient financial and economic analysis of mining activity in the developing world and Africa. This asked the basic question of whether the ultimate owner of the subsoil mining asset (the country and its people) was getting a fair deal from what in a few years had become an extremely valuable resource due to changed global demand, in particular from Asia. Several important global

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<sup>3</sup> In Zambia this happened to several companies. The most prominent among them was Anglo American, which withdrew just 2-3 years after taking over the Konkola Copper Mine (KCM), with USD several hundred million in accumulated losses.

<sup>4</sup> Note that gold and copper had opposite trends for two of these three decades. Gold prices increased tenfold from 1971/2 to end 1980s, while copper prices varied only a little.

<sup>5</sup> Point made in February 2013 in comments by anonymous referee appointed by ICTD.

reports were published on this phenomenon in the developing world and Africa in particular (Christian Aid 2007).

A vigorous public debate emerged in the two countries covered in this paper, Zambia and Tanzania. These are both important mining countries, albeit with somewhat different histories.

Zambia has a history of disputed changes with strong political interests (Lungu 2008; Fraser and Larmer 2010; Jesuit Centre for Theological Reflection 2011; *Zambian Economist* 2011). The Deputy Minister of Finance in Zambia stated in November 2012 that 'Zambia loses between USD 1.5-2 billion every year due to tax evasion and avoidance, mainly in the mining sector'. Our benchmarking exercise in Section 3 indicates that his statement holds some truth.

Similarly to Zambia, Tanzania introduced a new mining policy and legislation in the late 1990s, which introduced a wave of new investment and rapid increase in production and export levels. In Tanzania, however, the turnaround in relative terms has been even more dramatic (as commented below). Similar public concerns emerged in mid-2000 regarding limited government revenue from the mining sector (Curtis and Lissu 2008), and several government commissions were tasked to come up with reform measures.

Zambia and Tanzania represent two 'mining countries' in SSA, due to the size of their mining activity. In both countries mining has a long history. In each country one single mineral dominates completely (>90 per cent of value produced): in Zambia it is copper, and in Tanzania it is gold.

Both countries have witnessed a strong increase in production and in the value of their principal mineral export product. In Tanzania, the annual value of their gold export increased from USD 22 million in 1998 to USD 2,200 million in 2011. This was caused by a tenfold increase in the quantity produced (up to a maximum of almost 50 tons of gold per annum), and very large global price changes.<sup>6</sup> In Zambia, the value of the copper export increased from USD 350 million in 1999 to USD 8,400 million in 2011. This was caused by a combination of an increase in production from 250,000 to 900,000 tons, and the increase in copper prices.<sup>7</sup>

The main question we will try to shed light on in this paper is the extent to which this turnaround in the profitability of extraction and production of non-renewable resources, particularly copper and gold in Zambia and Tanzania respectively, has led to increased government revenue. This revenue is necessary to transform subsoil assets into financial assets for the primary owners of the resources - the country of origin of the resource through its government - and affects national wealth. Recent IMF global evidence on extractive fiscal design and revenue collection suggests that rent capture in mining on average may be only half that in petroleum (one-third versus two-thirds or above) (IMF 2012).<sup>8</sup>

This paper first briefly presents mining development from an historical perspective in Zambia and Tanzania. The second section summarises the main elements of mining tax regimes of seven major mining countries, with additional detail on our two focus countries. Section 3 provides a benchmarking based on empirical evidence. This moves from aggregate macroeconomic level, using recently available estimates of adjusted national savings and wealth for key developing regions and Zambia, to estimates of foregone mining revenue in

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<sup>6</sup> Authors' calculation based on Tanzania Mineral Audit Agency (TMAA) and Ministry of Energy and Minerals (MEM) data from annual reports available on their websites: <<http://www.tmaa.go.tz/>> and <<http://www.mem.go.tz/>>.

<sup>7</sup> Authors' calculation based on Bank of Zambia data from their website.

<sup>8</sup> See page 6, executive summary, in IMF (2012).

Zambia and Tanzania, using Chile as a benchmark country. In Section 4, we utilise recently available EITI country reports for Tanzania and Zambia to assess actual tax revenue received from the mining sector.<sup>9</sup> The fifth section summarises the discussion regarding tax regimes and revenue, as well as adding information on ownership interest, technical capacity and political will. The final section concludes with some lessons for poor but resource-rich developing countries.

# 1. Mining development

## 1.1 Tanzania

In Tanzania there is a considerable history of exploration and production, in particular of gold, diamonds and gemstones. The earliest discoveries and attempts at larger-scale production came during German colonial rule from the late 19<sup>th</sup> century to the First World War. Several of the current significant deposits of gold, such as the Geita gold mine and the large region of this area in northern Tanzania, have therefore been mined for a long time.

Independence in Tanzania in 1961 seemed to bring similar stagnation in the mining sector, following nationalisation and state control, to that observed in Zambia during the first decade after independence. For a time, diamond mining became more important in Tanzania, with up to 70 per cent of the total value of national mining production. Similar to Zambia, a national company, the State Mining Company Ltd. (STAMICO), was established in 1972 to operate the major deposits. Levels of reinvestment were low, and gold production in particular suffered in this period.

In the 1980s a period of liberalisation started in the Tanzanian economy, followed by privatisation in the 1990s. Initially this led to an increase in small-scale and artisanal mining. This was followed in the latter part of the period by large-scale commercial gold and diamond mining, with international mining companies and foreign capital and technology. Between 1998 and 2005, six large-scale gold mining operations were opened (several, if not all, in historic gold deposit areas): Geita, North Mara, Buzwagi, Bulyanhulu, Tulawaka and Golden Pride. Through its fully-owned entity, African Barrick Gold, the largest gold mining company in the world - Canadian Barrick - established 100 per cent ownership of North Mara, Buswagi and Bulyanhulu, and 70 per cent of Tulawaka. Of the remaining two large gold mines, Anglo Gold Ashanti (South African-Ghanaian partnership) owns the Geita mine, and Resolute Ltd. (an Australian company) owns Golden Pride mine.

Since privatisation of large-scale gold mining operations in Tanzania, an estimated USD 2-3 billion of foreign investment has been made in the sector, the number of mining licences in Tanzania has increased from 9 in 1990 to 4,000 active large-scale licences in 2007, and employment in large-scale mines has increased from a few thousand up to 10,000 people. Measures of indirect employment are difficult to come by, but it has been said that this may have increased from just above 10,000 to over 60,000 people.<sup>10</sup> These numbers, however, are very small compared to estimates of 150,000-500,000 people employed in informal mining in Tanzania (Lange 2006). The level of earnings and overall contribution to the national economy from informal mining, however, seem very small.

Despite the prolonged low international gold price from the late 1940s to 1971/2, mining (primarily gold) in the early 1960s already contributed between 3-4 per cent of Gross Domestic Product (GDP) (Lange 2006). This is similar to current estimates that the mining

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<sup>9</sup> For more information on the EITI concept, see <<http://eiti.org>>.

<sup>10</sup> From presentation made by Deo Mwanyika, then Chairman of Chamber of Mines in Tanzania, in 2007.

sector has contributed between 4-5 per cent of GDP in recent years. These figures indicate that mining has always made a much more modest contribution to the national economy in Tanzania than in Zambia.

Another fundamental difference in Tanzania compared to Zambia was the global price trend observed for copper versus gold. Whereas copper maintained high global prices for most of the 1950s up to the early 1970s, gold prices kept low from the late 1940s up to 1971/2. Then, contrary to copper (which then went into a prolonged period of low global prices), the global gold price saw a tenfold increase between 1971/2 and the end of the 1980s. Despite this opportunity, the mining sector overall stagnated in this period in Tanzania. By 1988, its contribution was only 1 per cent of GDP and 0.3 per cent of government revenue (Lane 1996).

## 1.2 Zambia

In Zambia, large-scale commercial production was already underway during the colonial period following the establishment of the British South African Company (BSAC).<sup>11</sup> BSAC had exclusive concessions in the early 20<sup>th</sup> century to explore and exploit below ground resources in different parts of what is today Zambia. Later on, companies such as the Roan Selection Trust and Anglo American invested substantially, and by 1940 a total of 26,000 people were already employed in the copper mines.

By the early 1970s Zambia was a leading world producer of copper, with a maximum production of 750,000 tons per year. Following nationalisation of the mines in 1972/3, the state took over ownership through the state company Zambia Consolidated Copper Mines Ltd. (ZCCM). This lasted until the privatisation of the mines in the late 1990s and early 2000s.<sup>12</sup> After some initial failures by the first round of owners of some mining operations and smelters, by 2004 the industry had a diverse international ownership base with a mix of Swiss (Glencore Ltd. - majority owner of Mopani), Canadian (First Quantum Minerals Ltd. - majority owner of Kansanshi), Indian (Vedanta - majority owner of Konkola Copper Mine (KCM), and Chinese (several companies and smaller operations and smelters).

After privatisation the government has maintained a minority ownership share of 10-20 per cent in most of the mines through the holding company Zambia Consolidated Copper Mines – Investment Holdings Plc. (ZCCM-IH) (75 per cent of ZCCM-IH shares are controlled by the Government of the Republic of Zambia (GRZ)). This holding company has absorbed in total up to USD 1 billion in debt from the companies that were privatised, and has been involved in some related industry investments (Rakner 2003).

During the period following the privatisation of the mines in Zambia, foreign investment worth USD 3-4 billion in total has been made, and employment in the industry has increased from 25,000 to above 60,000, according to GRZ estimates. Production of copper has increased from 250,000 tons per year up to almost 900,000 tons per year. The production of cobalt has also increased over the period, and today Zambia is the second largest global producer of cobalt, behind the Democratic Republic of the Congo (DRC).

The contribution of the mining sector to the economy has varied significantly since the early days of large-scale mining in Zambia. In the early period, prior to independence in 1964, the majority of mineral revenues were expatriated. Before the formation of the political Federation of Rhodesia and Nyasaland (which covered what is today Zimbabwe, Malawi and

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<sup>11</sup> BSAC was founded by Cecil Rhodes in 1889 with ambitions to colonise and promote economic development in large parts of SSA in an imperialistic manner during the early era of the Race for Africa. For details on the history of mining in Zambia, see Adams and Simpasa (2009).

<sup>12</sup> Kaunda (2002) provides an interesting in-depth though partial account of the process (the author headed the privatisation team of GRZ).

Zambia, and lasted from 1953-63) the revenue was mainly transferred to BSAC. In later years, there was some increased sharing with the local British colonial government. In the Federation period, an estimated 80-90 per cent of mineral revenue from what is today Zambia was transferred to what is today Zimbabwe, and utilised for large capital expenditure (Sampson 2002).

In the first decade after independence, contributions to the economy and government revenue in Zambia increased. In 1970 the mining sector contributed 36 per cent of GDP and 58 per cent of government revenue. Due to a mix of low global copper prices, underinvestment in the mines, and unsustainable levels of revenue transferred from the mines even in times of low or no profits, between 1973 and 1985 the contribution from the mining sector dropped to 13-16 per cent of GDP and 5-18 per cent of government revenue. In the 1990s this came down further, to 5-10 per cent of GDP and nothing to government revenue (Mupimpila 1998). In fact it was significantly negative - at the end of the 1990s it was estimated that the treasury had a net loss of USD 1 million per day (Whitworth 2011).

After privatisation of the mines in the late 1990s and the increase in the real price, the contribution of the mining sector has improved gradually in Zambia. Contributions over the last decade vary from 70-80 per cent of exports, 3-5 per cent of GDP<sup>14</sup> and 5-18 per cent of domestic revenue<sup>15</sup>.

Finally, there is also a long history of diamond and gemstone mining in both Tanzania and Zambia. The importance of these activities is probably much smaller overall in terms of contribution to the economy, exports, formal employment and government revenue. These activities also have rather different characteristics in terms of production and value chain, level of informality and a lack of reliable data and information. To do justice to the subject, diamond and gemstone mining would need separate research and analysis.

## 2. Mining taxation regimes

Mining tax regimes around the world have changed significantly over the last few years. However, for the period covered here, from 1998 to 2011 in particular, major elements were fairly similar across key mining developing countries, including the level of royalty, corporate income tax (CIT), withholding tax (WHT), large exemptions of indirect taxes, high capital depreciation and no ring-fencing.

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<sup>14</sup> Note that this is a huge underestimate. A draft rebasing exercise by the Central Statistical Office (CSO) in 2009 had an estimate of 16-18 per cent of GDP. It is likely in recent years to have gone substantially higher than this, something that will be commented upon later in this paper.

<sup>15</sup> This is substantially above the average for the 1998-2011 period of 4.4 per cent. The increase has particularly happened after 2007-8, up to a record of over 18 per cent in 2011 with windfall tax debt settlements.

**Table 2.1: Main elements of mining tax regimes in seven countries**

	Royalty	CIT	WHT	Allowance	Ring-fencing
Zambia	0.6-3 %	30 %	0-15 %	100 %	No <sup>16</sup>
Tanzania	3-4 %	30 %	2-10 %	100 %	No <sup>17</sup>
Ghana	3-6 %	25 %	0-8 %	80-100 %	No
South Africa	1-3.4 %	28-34 %	0-12 %	100 %	Yes <sup>18</sup>
Botswana	3-10 %	22 %	7.5 %	100 %	No
Chile	5 %	17-20 %	4-30 %	Straight line	No
Australia	0-18 %	30 %	5-30 %	Life of mine/asset	No

Source: PwC (2010)

A note to add regarding the above table is that royalty rates were applied to some form of net or profit-based estimate for most of the period. In recent years this has increasingly turned towards gross-based estimates. Some countries, such as Australia, Ghana and Papua New Guinea, attempted to introduce additional taxes on profits and/or different forms of resource rent taxes, but these had limited impact on overall mining revenue (Sunley and Baunsgaard, 2001).

A final note is regarding the tendency of SSA mining countries to apply significantly lower withholding taxes, and to allow almost immediate capital depreciation. Both trends diverged significantly from the practice in more mature mining countries, such as Australia and Chile. When this was combined with limited use of ring-fencing, and a major phase of reinvestment in particular in the early years after privatisation in the late 1990s and early 2000s in SSA, it resulted in large tax losses that were carried forward in most cases without any limitation.

The mining tax regime in **Tanzania** was basically an outcome of efforts to make the sector more attractive in the late 1990s, following decades of public ownership and stagnating levels of investment. The main features were defined in the 1998 Mining Act, and included (for the large-scale gold mining that dominates in the country): 3 per cent royalty rate on netback value (calculated as gross revenue minus transport and sales costs); corporate tax on profits at 30 per cent; 100 per cent capital allowance (+15 per cent uplift per year for unredeemed capital expenditure); indefinite loss carry forward; WHT (dividends 10 per cent, interest, technical services 3 per cent, management fees 2 per cent); customs duties (maximum 5 per cent with initial exemptions); Value Added Tax (VAT) relief (on imports and domestic purchases); and fuel levy exemptions.

The tax regime for mining was further adjusted in the new Income Tax Act of 2004, with the removal of the 15 per cent uplift for capital expenditure, increases in WHT rates and strengthening of the thin capitalisation rules. For most mining companies these changes only applied on a 'voluntary' basis, as they all had fiscal stabilisation clauses in their mining development agreements. Enforcement of these changes has proved to be difficult in practice, and the low levels of mining tax still collected triggered several government studies

<sup>16</sup> Introduced in 2008 through adjustments to the Income Tax Act and the Mining Act.

<sup>17</sup> Introduced in new Mining Act of 2010 by mine. It did exist by company in earlier legislation, although it is unclear if that had the intended impact.

<sup>18</sup> Deduction of accumulated costs from loss-making mines was possible with government authorisation in practice. Therefore strictly speaking it was not a ring-fencing regime.

and commissions. These again led to changes in the Mining Act in 2010: the increase in royalty from 3 to 4 per cent for gold; further specification of thin capitalisation rules (70/30 debt/equity ratio); ring-fencing by mine; limitation of VAT exemption to exploration and prospecting; and the possibility of limited free government equity.

For **Zambia**, until the 1970s the mining tax system was mainly a royalty system based on gross mine production value.<sup>19</sup> The recurring discussion regarding the system was mainly focused on who were the recipients of the royalty.<sup>20</sup> Prior to nationalisation in the early 1970s, the effective tax rate for mining was estimated at 73 per cent (Sardanis 2003). It is perhaps no surprise that government mining revenue has never been higher than between independence in 1964 and the early 1970s, with contributions to domestic revenue at above the relative levels seen in even some of the more successful petroleum countries. After nationalization the effective tax rate was largely maintained, but the government never managed to collect similar levels of mining revenue again.

Following the privatisation process started in the late 1990s, a revised tax regime emerged for the large copper mines with basic elements of: royalty of 0.6 per cent on gross sales; CIT of 25 per cent on profits; 100 per cent capital depreciation; loss carry forward of ten years; exemptions on VAT for most inputs; withholding taxes; as well as excise and customs levies and fees.

In 2007, further changes included raising the royalty rate from 0.6 per cent to 3 per cent, a corporate income tax rate of 30 per cent and a 15 per cent withholding tax on dividends, management services and interest on loans from associated companies. These changes, however, were only applicable to future mining production licence holders, and therefore did not affect the major mines in Zambia.

Following a process of extensive national debate and external technical assistance, and a national renegotiation committee being constituted, in April 2008 the country introduced the following additions to the 2007 mining tax regime: a variable income tax of 15 per cent (on net profits above 8 per cent); a windfall tax (25, 50 and 75 per cent rates above copper price thresholds that started at 200 per cent of the average operational cost levels in the large mines in Zambia); 15 per cent export levy on concentrate export; 15 per cent withholding tax on services; 25 per cent capital allowance; hedging treated as a separate business activity; new limitations on loss carry forward; introduction of reference price to limit transfer pricing; and ring-fencing of new mine investments and operations.

The April 2008 changes to the mining tax regime were quite dramatic because they were introduced through legislative changes and the abolition of the mineral development agreements. In practice some of the changes, such as the windfall tax, were only ever implemented in part. With the April 2008 tax regime, it is important to note that the windfall tax was introduced without being made deductible to corporate income tax. This meant that, for high-cost mines and at high prices, the marginal tax rate could go above 100 per cent. The mistake was a result of political pressure; the Zambia Revenue Authority (ZRA) made adjustments, and only the rate of 25 per cent was ever utilised.

The global financial crisis hit the world hard in August-September 2008. This triggered a 60 per cent fall in the global copper price in just a few months. This, together with the on-going debate particularly about the windfall tax, and the threat of closure of several of the mines in

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<sup>19</sup> For a recent assessment and benchmark of the taxation regime, see Manley (2012).

<sup>20</sup> Before the new Mines and Minerals Act was introduced in 1970, the tax regime consisted basically of three main components: royalties of 13.5 per cent per ton of the established London Metal Exchange (LME) price (during the month less 8 pounds), export tax of 40 per cent of the price per ton of copper above ZMK 600 (no export tax was paid at prices below K600) and Income tax of 37.5 per cent of the first ZMK 200,000 profit and 45 per cent thereafter. For further details see pages 15-20 in Mupimpila and Van de Grijp (1998).

Zambia, led the new government in April 2009 to enact the following reversals: removal of the windfall tax, reintroduction of 100 per cent capital allowance, and the reintroduction of hedging as a regular business activity of mining. In 2010, the government announced that it had settled disagreements regarding outstanding windfall tax debt, and these were settled subsequently. In 2012 the royalty rate was increased from 3 to 6 per cent, and in 2013 it is expected that the capital allowance will again be reduced to 25 per cent and only applied from the year the asset is used.

### 3. Why is taxation of mining so important? A benchmarking exercise

As explained in the introduction, the fundamental reason for the importance of taxation of mining is that mining entails extracting subsoil assets and transforming these into financial assets. These assets have varying degrees of value added, depending on the refining and product development needed. What is left after costs of production and marketing are deducted (including normal dividend to investment) is defined as economic rent. In principle, for a non-renewable resource such as minerals, such rent should be appropriated by the government on behalf of the country. It is not feasible to accomplish this 100 per cent without negatively affecting the private incentive to invest in mineral production. Therefore most countries try to balance the competing interests and achieve as high a percentage as possible for the government, often mainly through taxation or direct financial interest.

Adding to the above challenge is the fact that mineral production tends to be developed in economic enclaves, with high capital intensity (often foreign investment), and limited direct employment and multiplier effects in the local and national economy. It is important to recognise however that this can vary a lot between countries. Whereas the leading mining countries, such as South Africa and Australia, may not be that much better than many developing countries in terms of mining taxation (more on this below), they tend to have mining sectors with strong indigenous mining companies (many of them multinational companies) and associated companies and firms with a considerable level of technological development and value added. This means that the local content factor is significantly higher, and that there is a higher probability that more of the profit and the rent that is privately appropriated may be retained and used domestically, thereby generating larger economic and social multiplier effects.

An illustration of the employment factor is that in Zambia direct employment in the mining industry accounts for less than 5 per cent of the total active working population. There are over 40,000 people (unionised) working in mines in Zambia, and over 30,000 temporary staff. This means that mines are among the most important employers in the formal economy in the copper belt or the North-Western province. However, at the national level, direct employment in mines remains limited, which can be explained by the fact that mining is capital-intensive. This is found in most resource-rich countries all over the world. Similarly, in Tanzania large-scale gold mines, which account for 85-90 per cent of the production and export value in mining, directly employ about 10,000 people. If temporary staff are included, as well as some indirect employment, this number may increase up to 50-60,000 people. This is less than 3 per cent of the total active working population nationwide. However, large-scale gold mines are some of the most prominent employers in the formal economy in the fairly remote north-west regions of Tanzania, where mining is concentrated.

In our benchmarking analysis below, we start by summarising some overall findings from a recent cross-regional empirical study that calculated the adjusted national savings and

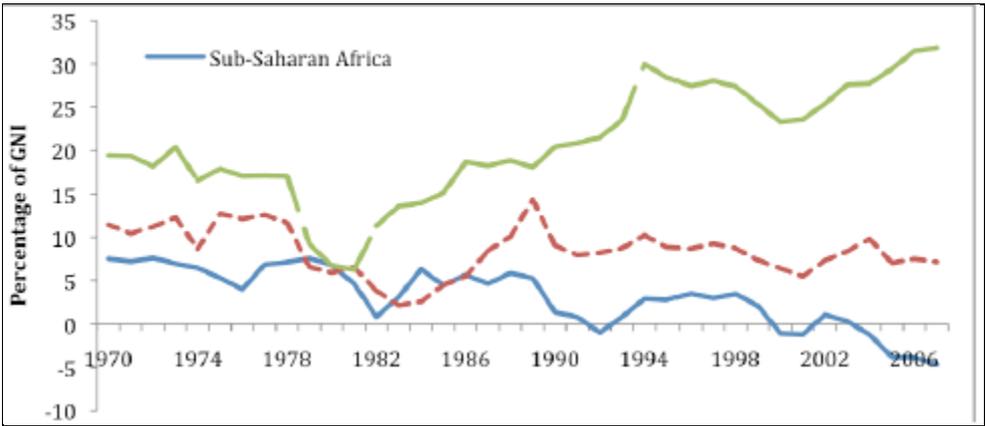
'genuine' wealth from 1970 to 2010 (Hamilton and Ley 2011). This provides a possible indication at national and regional level of the extent to which the 'resource boom' experienced from 2004/5 led to efficient resource rent capture (through tax or ownership interest) that was saved and invested.

A more specific mining sector benchmarking exercise is then carried out, where we examine the relationship between: 1) the contribution of mining to GDP; and 2) the contribution of mining to domestic revenue (DR). The following rule of thumb provides a guide: 'Mineral revenues should be a greater share of total revenue relative to the sector value added because the government is collecting royalties on a factor of production, a phenomenon unique to the mining industry' (Conrad 2012, p. 15). We estimate, based on publicly available sources, the average numbers of 1) and 2) for seven major mining countries in the period 1998-2011. We then utilise Chile, the second best country in the sample (after Botswana), to examine what would have happened to revenue from the mining sector in Zambia and Tanzania from 1998 to 2011 if they had had the same ratio between 1) and 2) as Chile. (This would mean a higher contribution of mining to domestic revenue relative to the contribution of mining to GDP, than what they actually achieved). We call this the 'adjusted mining revenue' (as compared to the actual mining revenue, or the one they collected in those years).

### 3.1 Mineral 'boom' and adjusted national savings

Ley (2010) argues that adjusted Net National Income (NNI) is a more appropriate measure of economic performance than GDP for a country with significant exhaustible natural resources and a large number of foreign investors.<sup>22</sup> In the case of Zambia, after properly adjusting NNI for the depletion of natural resources, he finds very low (and often negative) rates of *adjusted* savings. The conclusion is that the current macroeconomic trajectory is unsustainable, as it implies shrinking national wealth. In order to reverse this trend, Zambia needs to: (i) capture a larger share of the resource rent, and (ii) invest that share effectively to increase productivity and the nation's wealth. This is not specific to Zambia. While East Asia's adjusted savings exceed 20 per cent of Gross National Income (GNI), Latin America's are 5-10 percent of GNI, and Sub-Saharan Africa's are negative or negligible in recent times (see graph 3.1).

**Graph 3.1 Adjusted savings as a percentage of GNI 1970-2008**



Source: Ley (2010).

<sup>22</sup> For details on computations, see Hamilton and Ley (2011). Hamilton and Lutz (1996) proposed a measure of *adjusted (or genuine) savings*, defined as net national savings adjusted for the value of resource depletion and environmental degradation.

### 3.2 Contribution to GDP and domestic revenue

In what follows, we present a comparison of seven major mining countries. Most of these are from SSA, but some other major mining countries are included. Table 3.1 examines: 1) the contribution of mining to GDP; 2) the contribution of mining export relative to GDP; and 3) the contribution of mining to domestic revenue (DR). All the numbers cover the period 1998-2011, and have been calculated using publicly available sources and nominal figures (mostly in national currencies but in some cases either converted to or in USD).

The starting point and rationale for this multi-country comparison is the assumption that, on average, mining should at least contribute as much to DR as it contributes to the economy (measured here in GDP in current prices), in order to be able to say that there is an effective benefit-sharing originating from the large-scale mining production and export in the countries examined. In fact, considering the non-renewable nature of mining and the inherent economic rent associated with this, in particular in large parts of the period 1998-2011 covered here, one could have expected that the sector should have contributed more to total DR than its contribution to GDP.

**Table 3.1 Average annual percentage contribution of mining to total GDP and Domestic Revenue (DR) for the period 1998-2011 (all numbers in current prices)**

	Mining value added/GDP (% contribution)	Mining export/GDP (% contribution)	Mining revenue <sup>23</sup> /DR (% contribution)
Zambia	3.7	24	4.4
Tanzania	3.1	4.9	2.3
Ghana	4.5	12.5	3.1
South Africa	8.3	11.8	2.3
Botswana	38	32	50
Chile	12.9	17.1	14.9
Australia	6.4	12.2	4

Sources: National statistical bureaux, central banks, IMF reports, national revenue authority data and chamber of mines annual reports for the seven countries.

The data underlying this snapshot of the contribution of mining to the economies of the seven countries covered here over a period of fourteen years, which includes both the boom period since 2004/5 as well as an equivalent period of low mineral prices, has a lot of potential for interpretation and further analysis.

In this paper we will highlight four initial main findings:

1. *Botswana and Chile both have a ratio between the contribution of mining to domestic revenue and GDP that is significantly higher than for the other countries in this sample.* The countries deliver according to the rule of thumb established (Conrad 2012) that this ratio should be above 1. For Botswana it is 1.32 and for Chile it is 1.16 for the period covered (for the former this is regardless of whether the GDP contribution is utilised or not, whereas for Chile it would move closer to 1 with an adjusted GDP estimate). As argued above, this is what one would expect from a non-renewable resource sector with significant economic rent being extracted, in particular in a period with many years of historically high prices in real terms.<sup>24</sup> As we see from the sample of countries above,

<sup>23</sup> For all seven countries Pay As You Earn (PAYE) and other employee tax payments are excluded. VAT payments are also excluded, mainly due to exemptions or zero rating. PAYE and VAT are included in section 4 below for two financial years for Zambia and Tanzania.

<sup>24</sup> See for example Advani (2011). It contains average annual copper prices 1900-2010, adjusted to 2010 prices. For gold, see several similar web graphs, for example at <[www.finfacts.ie/private/currency/goldmarkets](http://www.finfacts.ie/private/currency/goldmarkets)>, where the entry 'Gold market and price 1800-2011' shows the nominal and some of the real price developments. The

however, this has not been the case on average, despite some clear improvements during the mineral price boom, in particular from 2005/6 to date.

2. *Tanzania, Ghana and Australia display fairly similar proportions of mineral revenue to total domestic revenue, compared to their mineral sector value added contributions to GDP (0.74, 0.68 and 0.63 respectively).* In contrast, South Africa has a percentage contribution to total domestic revenue that represents only 0.28 of the nominal mineral value added contribution to nominal GDP (2.3 per cent versus 8.3 per cent). Looking at recent years, 2007/8 to date just makes this comparison worse, as Australia and Ghana (and Tanzania to some extent in 2010 and 2011) have improved their mineral revenue contribution relative to domestic revenue close to or above that of the equivalent value added contribution to GDP.
3. *Zambia has the most extreme discrepancy between the estimated mining sector value added contribution to GDP and the mining sector export value as a percentage of GDP.* This discrepancy only grows larger towards the end of the period, and in 2011 is as large as 1 to 10 (compared to an average of 1 to 5-6 for Zambia in the period). Adjusting this down to more 'normal' levels shows that the proportional mineral revenue contribution to total domestic revenue in the total time period covered has been dramatically below averages for even the lowest comparator countries in this sample.

From 2008 to 2011 in Zambia the mineral revenue as a percentage of domestic revenue has however grown much faster, and in 2011 it was as high as 18.9 per cent<sup>25</sup> (compared to the average of 4.4 per cent for 1998-2011). Compared to the likely level of an adjusted value added contribution to the nominal GDP, of perhaps 30 per cent (using the average value added contribution compared to that of its export, relative to total nominal GDP from the sample of eight countries here for the period 1998-2011), this is however still modest considering the trend in countries like Australia, Ghana and Tanzania, and of course Botswana and Chile.

4. Most major mining countries covered here have a relatively low level of contribution from mining to total domestic revenue (DR) considering the mining contribution to GDP. The two worst countries by far are Zambia and South Africa, with ratios respectively of close to 1:5<sup>26</sup> and 1:4 between the contribution percentages to GDP and DR. This compares to Ghana and Australia where the ratio is close to 1: 1.5, and Tanzania where it is slightly lower (1: 1.3). As mentioned under 1), Botswana is the best performer (1.32: 1), followed by Chile (1.16: 1).

We conclude this section with an estimate where we utilise the case of Chile, the second best performer overall in the sample of eight countries in the period. We calculate what would have happened if Zambia and Tanzania had had the same ratios between mining related value added to GDP, mining export to GDP and mining tax revenue to domestic revenue as Chile.<sup>27</sup> The comparison is particularly relevant for Zambia as, similar to Chile; it is also mainly a copper producing and exporting country.

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current real gold price of USD 1600-1700/troy ounce is still below the peak in real prices from 1980. Current prices would have to reach > USD 2300/troy ounce to be higher. Still, real prices over the last decade have increased significantly.

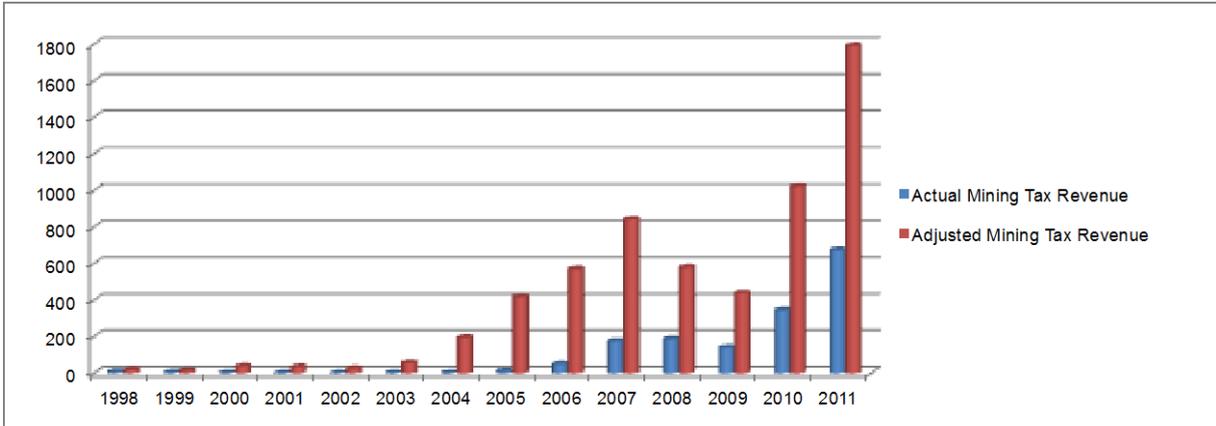
<sup>25</sup> Note however that this includes the significant settlement of windfall tax debt of several companies, accruing in the financial year of 2008/9.

<sup>26</sup> Authors' calculation based on an adjusted GDP contribution from 3.7 to 21 per cent on average in the period 1998-2011, using the average for the seven countries over the period. There are other options, of course, and, looking at Australia and Ghana, one could argue for a larger reduction. National accounts in Ghana in the period also however suffered large inaccuracies; see Jerven (2011), p. 1-2. An adjustment to the Australian ratio between GDP and export contributions of mining, would give an adjusted GDP contribution from 3.7 to 12-13 per cent on average for the period.

<sup>27</sup> We calculate for each year first the adjusted mining value added to GDP (using the ratio between the mining export to GDP and the mining value added to GDP). This is then multiplied by the adjusted mining tax revenue contribution to domestic revenue (using the ratio between the mining tax revenue to domestic revenue and the mining value added to

If Zambia had performed on par with Chile from 1998 to 2011, the achieved relative ratios between levels of contribution to GDP and contribution to DR from mining would have resulted in an increase in mining tax revenue to an adjusted (potential) of USD 6,027 million. The actuals observed were USD 1,596 million. This would be an increase of close to 300 per cent: USD 4.43 billion in total, or USD 316 million/year.

**Graph 3.2 Actual and adjusted government revenue from mining in Zambia 1998-2011**



Source: Authors' computations (see footnote 36). The tax revenue from mining is measured in current USD million on the left vertical axis, both for the actual and adjusted estimates.

Graph 3.2 shows the Zambia benchmarking with Chile from 1998 to 2011. It is clear that the majority of the effect comes from 2004 onwards, coinciding with the onset of the mineral super cycle. In 2011 alone, the increase in mining tax revenue would have been above USD 1 billion, a large increase considering that the 2011 actuals also included significant tax settlement payments dating back to the controversy and non-payment of the windfall tax in 2008,<sup>28</sup> and that net official development aid to Zambia in 2010 was USD 914 million according to the World Bank.<sup>29</sup>

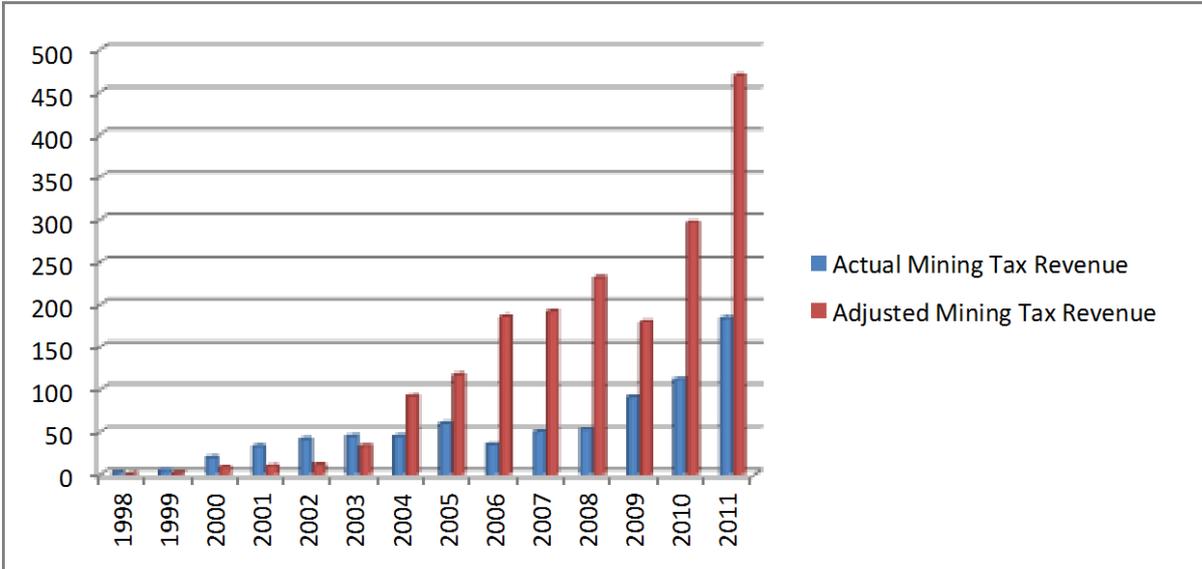
Graph 3.3 shows that the relative increase in adjusted mining tax revenue versus actuals in the case of Tanzania would be lower. This could be expected from what was stated under main finding 4), that the country had a relatively average level of contribution from mining tax revenue to domestic revenue considering its mining value added contribution to GDP (a ratio of 1: 1.3, compared with the ratio of Zambia of close to 1: 5 when using a more realistic adjusted mining contribution to GDP factor).

GDP). These ratios are then applied to the original data of Zambia and Tanzania to produce the adjusted mining tax revenue for each year 1998-2011.

<sup>28</sup> Or at least only partial payment by two companies, including the use of an escrow account for holding part of the payment from one of the two companies that did make some payments in 2008. The remaining companies only settled their outstanding windfall tax liabilities later, following negotiations with GRZ.

<sup>29</sup> <<http://www.tradingeconomics.com/zambia/net-official-development-assistance-received-us-dollar-wb-data.html>>

**Graph 3.3 Actual and adjusted government revenue from mining in Tanzania 1998-2011**



Source: Authors' calculation (see footnote 36) using same data as for graph 3.2. The mining revenue is measured in current USD million on the left vertical axis, both for the actual and adjusted estimates.

In total, if Tanzania had performed on par with Chile from 1998 to 2011 in terms of the achieved relative ratios between levels of contribution to GDP and contribution to DR from mining, it would have resulted in an increase in tax revenue from mining from USD 776 million to an adjusted USD 1,831 million. This would be an increase of 136 per cent: USD 1,055 million in total and USD 75 million/year.

The actuals observed as well as the adjusted (potential) mining revenue is shown from year to year over the period. Similar to the case of Zambia, the majority of the effect would have come from 2004 onwards (coinciding with the mineral boom), with a peak in 2011 of over USD 250 million in additional mining revenue from the adjusted calculation. It is interesting to note that in relative terms mining tax revenue collection was actually somewhat more efficient in Tanzania than in Chile between 1998 and 2003.

We now turn to a more in-depth examination of the composition of tax revenue from the mining sector in Tanzania and Zambia for two recent years, as shown in the first EITI reports (TEITI 2011; TEITI 2012; ZEITI 2011; ZEITI 2012).

## 4. Analysis of tax payments from the mining sector based on EITI reports

Thanks to the publication of data from numerous countries as a result of EITI processes, several analytical papers have been published that discuss experience with revenue collection and governance of the extractives sector, including mining, in countries such as Sierra Leone and Ghana (Maconachie 2009; Manteaw 2010).

However, so far neither disaggregated data analysis by mine, nor comparative analysis on the macroeconomic potential of mining taxation, have been carried out. Using EITI data for Tanzania and Zambia, the following sections intend to start filling this gap, and demonstrate

how useful country- and mine-specific EITI data can be to get detailed insights into the contribution and effectiveness of different types of mining taxes, as well as variations and common trends between mines and countries. This adds to analysis of how fiscal design has affected the outcome of mining taxes for the specific years covered by EITI data. This will be built on in the overall discussion regarding the importance of fiscal design, technical capacity and political will in Section 5.

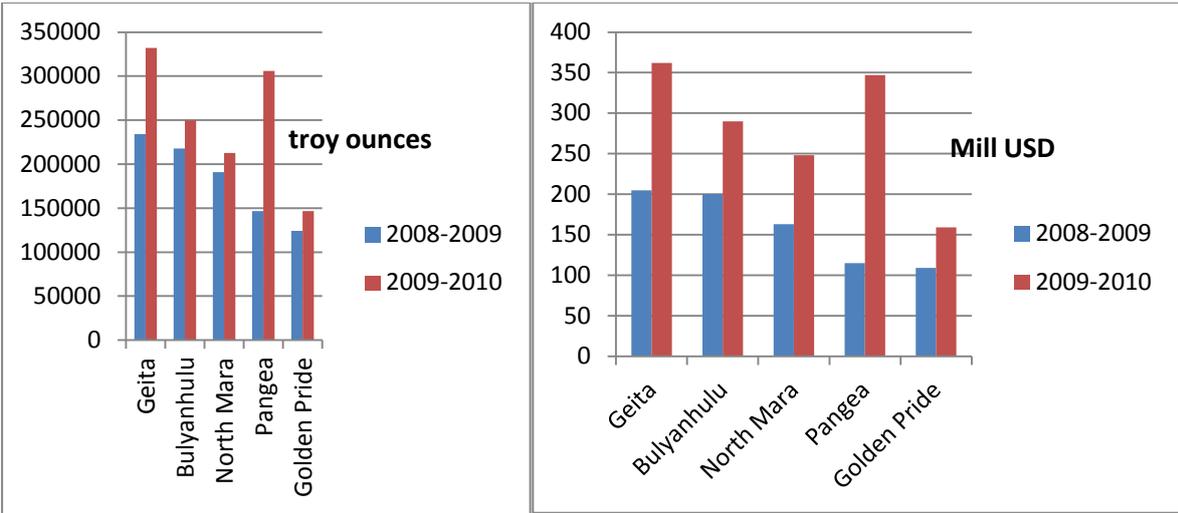
**4.1 Tanzania**

The TEITI (2011) and TEITI (2012) reports include data for two financial years, respectively covering 2008/9 and 2009/10. In both periods six major producing mines dominated the large-scale mining sector, all predominantly in gold; these accounted for 85-90 per cent of the audited export of gold from Tanzania. They also accounted for the majority of the direct investment, procurement and employment in the large-scale mining sector in the country.

The largest investor and owner in the large-scale gold mining sector in Tanzania is the Canadian company, Barrick Gold Ltd., through its fully owned subsidiary African Barrick Gold Ltd.<sup>30</sup> Barrick Gold is the world’s largest gold mining company They currently own four of the six largest gold mines in the country (Bulyanhulu, North Mara, Tulawaka and Buzwagi). These mines have produced on average more than 60 per cent of the total gold exported from Tanzania in 2008/9 and 2009/10. The second largest owner of gold mines in Tanzania is AngloGold Ashanti, a Ghanaian-South African mining company. They own the Geita gold mine, which has consistently been the largest producing gold mine in Tanzania, as well as one of the biggest in SSA. Finally, Resolute Mining Ltd., an Australian mining company, owns the Golden Pride mine.

The six large-scale gold mines in Tanzania increased both the quantity produced and exported in the two financial years covered here. The export values increased even more significantly due to the rise in average global prices. Graphs 4.1 and 4.2 show quantity and value for each individual mine.<sup>31</sup>

**Graphs 4.1 and 4.2 Audited export quantities and values by mine 2008/9 and 2009/10**



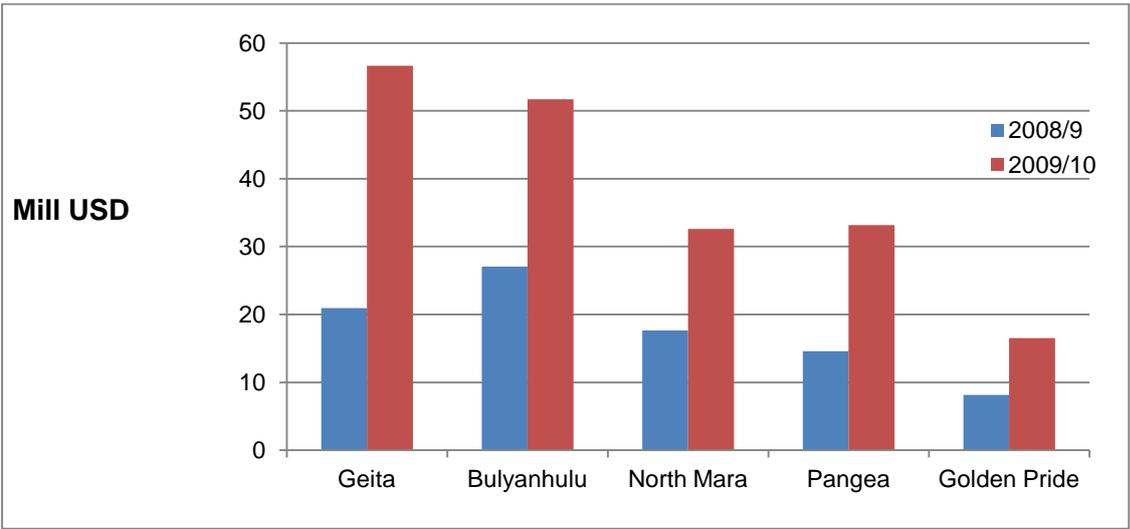
Source: TEITI (2011) and TEITI (2012)

<sup>30</sup> Until 2010, African Barrick Gold was 100 per cent owned, and today is 75 per cent majority owned, by Barrick Gold Ltd.  
<sup>31</sup> Note that Pangea includes here both Tulawaka and Buzwagi mines.

In total the export volume increased from 0.9 million to 1.2 million troy ounces, somewhat lower than the peak reached in 2003/4, when export volumes were between 1.4-1.6 million troy ounces. The associated export values, however, were much higher in 2008/9 and 2009/10, at USD 794 and USD 1,406 million, as compared to USD 550-600 million in 2003/4, due to the higher global gold price in later years. As explained earlier in this paper, this upward trend has continued, with an export value of USD 2,200 million in 2011.

We now examine the trend in total mining tax payments in the two financial years of 2008/9 and 2009/10 as shown in Graph 4.3.

**Graph 4.3 Reconciled mining tax payments**



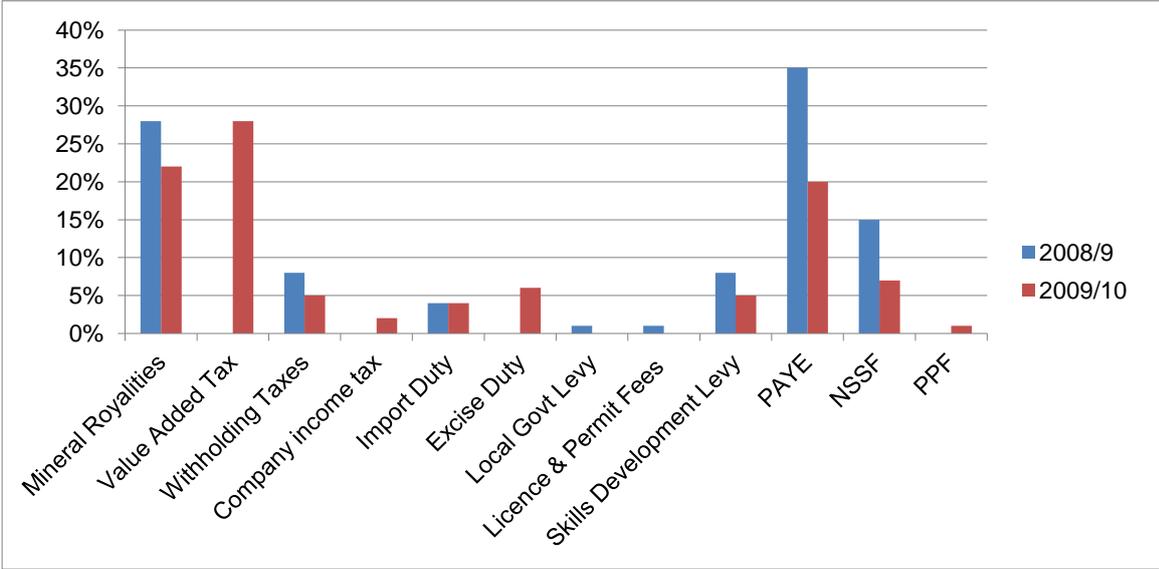
Source: TEITI (2011) and TEITI (2012).

The value of the mining export increased significantly over the period examined. This was due to the combination of an average increase of 37 per cent in volume of gold, and of 29 per cent in its realised sales price. The total reconciled tax payments from the mining sector, however, increased even more, rising from USD 88 million to USD 190 million from 2008/9 to 2009/10. The increase was significant across all the major mines, ranging from North Mara, with the smallest increase of 85 per cent, up to the highest of 171 per cent for Geita. The average increase for all major mines in Tanzania was 116 per cent. With the exception of Pangea, the relative increase in mining tax paid in 2008/9 to 2009/10 was higher than the increase in export/sales values. Excluding personal income tax (PAYE) from the calculation above, total reconciled mining tax payments were USD 57 million and USD 152 million respectively in 2008/9 and 2009/10. This illustrates the dominant but decreasing role of PAYE in total government mining revenue over the period.<sup>32</sup>

The two reports of EITI on Tanzania provide us with the first overall attempt to reconcile mining and other extractive industry-related tax payments. As we see below in Graph 4.4, the results showed some significant changes between the two years.

<sup>32</sup> PAYE is a method of deducting tax from employees' emoluments in proportion to what they earn. It reflects the tax contribution of the mining employee. Under this system, the employer is empowered to: a) calculate tax payable by every employee; b) deduct tax due from the emoluments; and c) remit tax deducted to ZRA. The term 'emoluments' means total earnings of an employee from employment. These include wages, salaries, overtime, leave pay, commissions, fees, bonuses, gratuities and any other payments from employment or office.

**Graph 4.4 Composition of reconciled mining tax payments**



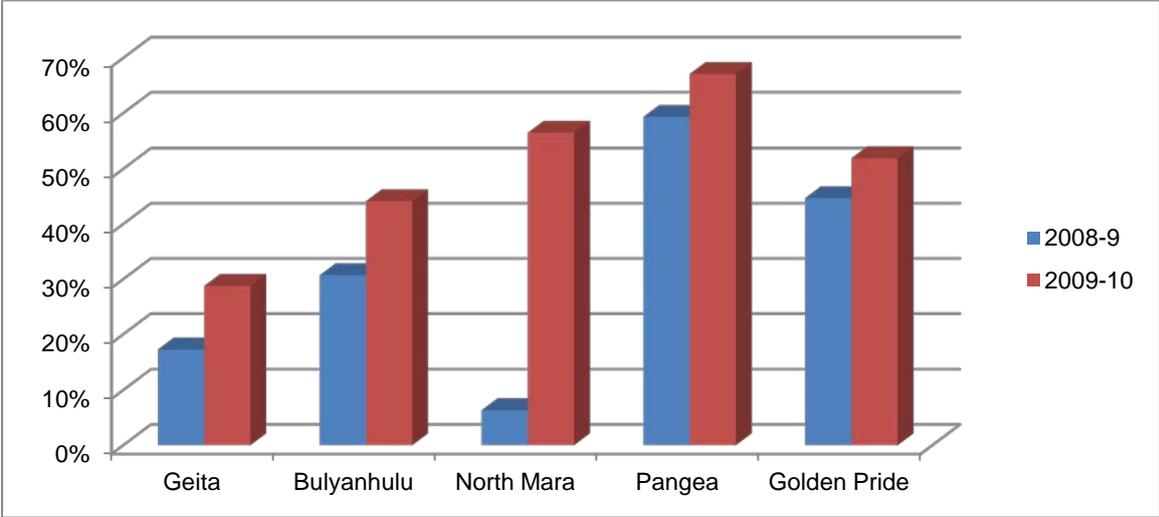
Source: TEITI (2011) and TEITI (2012). On the vertical axis are the percentage contributions from different types of mining tax payments to the total.

These are most likely due to a combination of: a) non-inclusion of VAT payments in the first report covering 2008/9, and b) large delays in final settlement of reimbursements of value added in the second report covering 2009/10 (thereby affecting the reported net payment amount). In addition, there were other smaller relative movements in the composition of mining tax payments registered for the two financial years. Because of these overall changes, the total so-called corporate taxes<sup>33</sup> paid increased in relative importance from 50 per cent in 2008/9 to 67 per cent in 2009/10. It is important to note however that this change, almost in its entirety, is due to the inclusion and size of the VAT payment in 2009/10, and there is substantial uncertainty related to its correct reflection due to delays in reimbursements.

To gain some further insights into the relative earnings and profitability of the large-scale mining companies covered in the first and the second EITI reports, we turn in Graph 4.5 towards something we have called implicit earning margin A (this is calculated as (export value minus cash cost) divided by the export value). This includes a closer examination of the levels of the so-called cash costs relative to the sales or export value per mine.

<sup>33</sup> Normally includes corporate income tax, mineral royalties, value added tax, import duty, skills development levy, local government levy, licence and permit fees, and the employer part of the National Social Security Fund (NSSF) and Public Pension Fund (PPF) contributions. In the calculation of the relative contribution here, the employer part of the pension contributions are not included.

**Graph 4.5 Implicit earning margin<sup>34</sup> A (export value-cash cost<sup>35</sup>)/export value**



Source: TEITI (2011) and TEITI (2012), TMAA (2011), annual reports for African Barrick Gold, Anglo Gold Ashanti and Resolute. On the vertical axis are the implicit earning margins A, calculated here as (export value- cash cost) divided by the export value.

It is clear from the company details that there were large differences between the mines in terms of their staffing intensity and the costs related to production. For example, the Golden Pride mine is by far the most efficient in terms of output per employee, outperforming Geita by a factor of more than 4:1 in 2008/9, although this was reduced towards 3:1 in 2009/10. This consideration is relevant due to the fact that labour costs in large-scale gold mining can typically account for 25-30 per cent or more, and large variations will influence the inherent profitability of the mine.

Often however there is not a straightforward relationship between the staffing delivery of value and the grade of the mine ore. The Golden Pride mine, for example, has the lowest average grade among the six mines, with 1.4 g/ton as compared with Tulawaka (part of Pangea) at 16.4 g/ton. To some extent these two mines are at the extreme ends of the range, being respectively the longest and shortest operating of the current large-scale gold mines in Tanzania.

Another notable change between the two financial years covered here is the 56 per cent reduction in cash costs from USD 804 to 508 per troy ounce gold produced at the North Mara mine, and the 90 per cent increase in cash cost per troy ounce at the Tulawaka mine from USD 217 to USD 413. It is difficult to believe changes of this size in just 12 months, especially considering investment-related amortisation is not included. This confirms that perhaps the major remaining problem related to effective tax collection from the mining sector in Tanzania is to establish a correct and agreed cost base for tax assessment.

Overall there is a clear upward trend in profitability as measured by the increase in implicit earning margin A from an average of 32 per cent to 50 per cent in the two financial years. The most extreme change is for North Mara mine, with a rise from 6 per cent to 56 per cent, and the least profitable mine (by this estimate) seems to be the Geita mine with 17 per cent and 29 per cent.

<sup>34</sup> Calculated using the troy ounce as reported by the companies and confirmed by government.

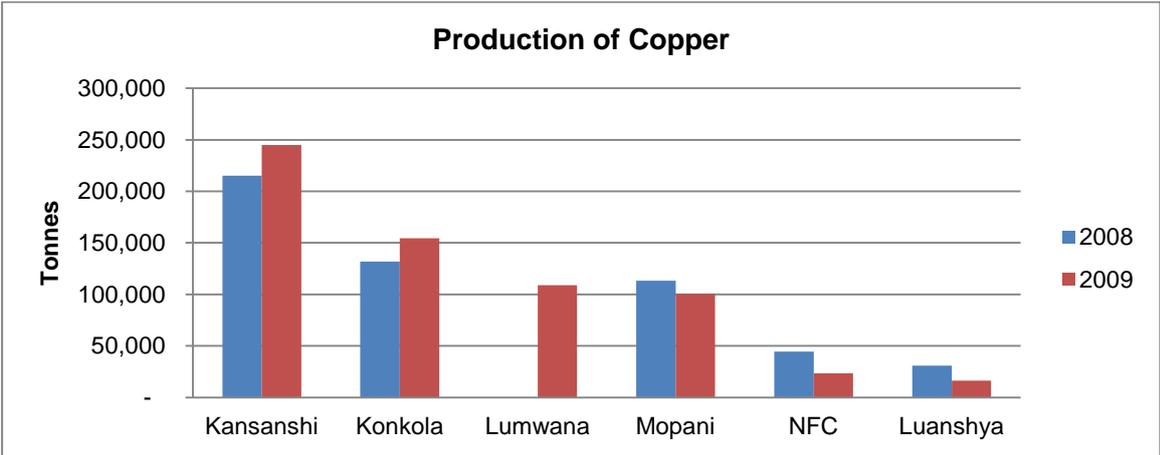
<sup>35</sup> Cash costs in mining are normally the costs of production, at site level, per unit of output. It includes transport, refining, royalties and administrative costs. It leaves out cost investment related depreciation and amortisation as well as non-site costs. The value of the by-products is deducted (Pietersz 2012).

### 4.2 Zambia

In this section we present the largest mines in Zambia in terms of production, total payments per mine, and a detailed breakdown of tax.

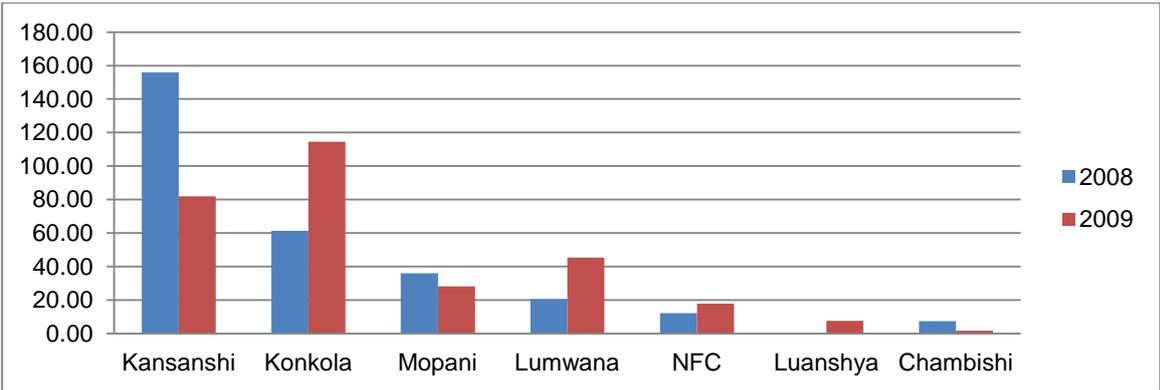
Graphs 4.6 and 4.7 below make a comparison between mine production and tax contribution for each mine for the seven largest mines in the country. Four mines dominate copper mining in Zambia: two brownfield operations (Konkola and Mopani) and two greenfield operations (Kansanshi and Lumwana).

**Graph 4.6 Copper production for the largest mines**



Data source: Bank of Zambia. Data not available for Chambishi separately. It is included in NFC (Non-Ferrous Company). NFC Africa Mining is a subsidiary of China Non-ferrous Metal Mining & Construction Group.

**Graph 4.7 Contribution to total mining taxes for the largest mines (including PAYE) (in USD million)**



Data source: ZEITI (2011) and ZEITI (2012).

The following sections are based on an analysis of the 2008 and 2009 EITI reconciliation reports (EITI 2011; EITI 2012). Overall, tax collection between 2008 and 2009 increased by 7 per cent from USD 415 million to USD 445 million. However, when PAYE is excluded, taxes decreased by 24 per cent to USD 316 million. This may be partly explained by the fact that copper prices decreased in 2009, and windfall tax had been abolished. It is worth noting that 28 extractive companies reported data in 2008 compared to 14 in 2009, and the 2009 report covered 24 different types of taxes while the 2008 report covered 13. According to World

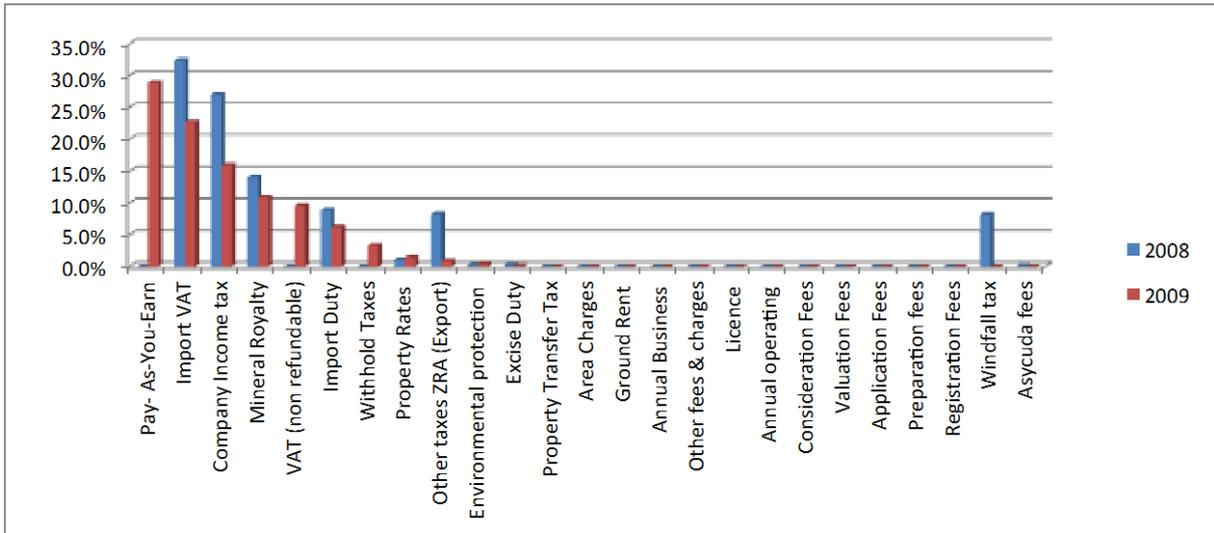
Bank (2012), which takes a more restrictive definition of mining taxes (windfall, variable profit, royalty and income taxes), mining revenue decreased from 1.9 per cent of GDP to 1 per cent, before going back to 1.9 per cent in 2010.<sup>37</sup>

Despite increased production, Kansanshi reduced its tax amount from 2008 to 2009, whereas Konkola increased tax contribution significantly. Kasanshi, which accounted for over 50 per cent of total mining tax in Zambia, reduced to less than 30 per cent. This is mainly due to the fact that employment at Konkola is higher than in Lumwana, and PAYE is much higher for Konkola.

Graph 4.8 shows that the five largest taxes account for almost 90 per cent of total taxes. Most of the reported taxes are marginal with a median for 24 taxes of USD 0.05 million. It is most interesting that it is a tax paid by employees (PAYE) that is the highest in terms of amount. VAT,<sup>38</sup> duties and mineral taxes account for most of the taxes, while corporate income tax only accounts for 15 per cent of total collected taxes.

It is a worth noting that PAYE is a withholding tax for the personal income tax. In order for PAYE to count as a proper contribution by mining, it must be assumed that the workers would not be paying PAYE if they were employed in another sector.<sup>39</sup> Therefore this tax should not necessarily be seen as a mining tax.

**Graph 4.8 Tax revenue as percentage of total mining taxes**



Data source: ZEITI (2011) and ZEITI (2012).

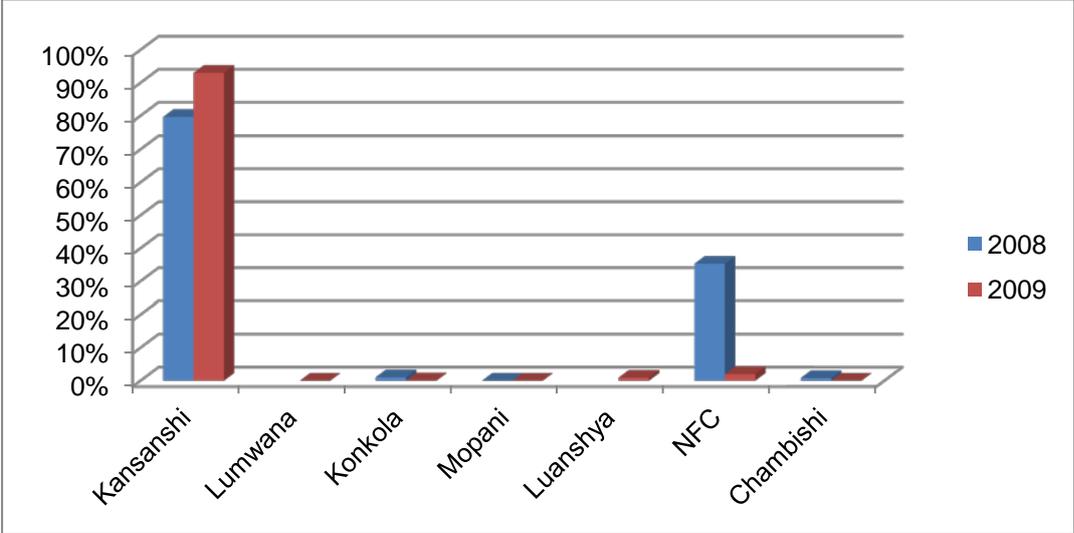
In 2008 the windfall tax was in place and contributed 8 per cent of total revenue collection (actually it was much higher since some of the disputed amounts were paid in 2011). Detailed calculations carried out by one of the authors in early 2009 showed that the total outstanding windfall tax liability for the large-scale copper mining companies was of the order of USD 170-180 million for April-June 2008, and USD 70-80 million for July-September 2008 (Lundstøl 2009).<sup>40</sup>

<sup>37</sup> Mining taxes increased to 5.5 per cent in 2011 mainly due to payments of arrears of windfall tax under escrow account as well as increase of royalty tax rate and are supposed to reach 3.8 per cent in 2012 (World Bank 2012).  
<sup>38</sup> Only the non-reimbursable VAT is taken into account.  
<sup>39</sup> A point made in February 2013 by an anonymous referee of this paper appointed by ICTD.  
<sup>40</sup> Using monthly export figures of copper from Bank of Zambia (BOZ) and monthly average copper prices from LME from April until the global financial crisis hit in late Quarter 3 of 2008.

This gives a total windfall tax liability for the applicable period of the financial year from April 2008 to end March 2009 of USD 240-260 million (the windfall tax did not apply below an average monthly copper price level of USD 5,512/ton). Out of this only slightly above USD 30 million was registered as collected by the ZRA in this financial year. In addition, an estimate of over USD 100 million was paid into escrow accounts, but only released later following final agreement/settlements with GRZ, and counted against 2010 and 2011 financial years according to information provided. This means that for financial year 2008, a full payment in year of the estimated windfall tax liabilities would have increased the total mining tax payment from USD 415 million to USD 625-645 million, and instead of 8 per cent would have accounted for 38-40 per cent of the total. This clearly shows the potential effectiveness of the windfall tax to increase mining revenue to the government, and, appropriately calibrated, this tax instrument can be efficient.

Graph 4.9 is interesting since it covers corporate and windfall taxes for the largest mines. It highlights that most companies do not pay large corporate and/or windfall taxes. For instance, Lumwana Mining Limited declared in 2009 that it had made USD 36 million profit (ZMK 182,160 million),<sup>41</sup> and yet it paid neither income tax nor variable profit tax. Only Kansanshi made a large contribution of corporate income and windfall taxes, and could question why most mining companies (such as Lumwana, Konkola and Mopani) do not contribute to these taxes, which are usually the main target of mining taxation

**Graph 4.9 Corporate and windfall taxes as percentage of total tax contribution**



Data source: ZEITI (2011) and ZEITI (2012).

<sup>41</sup> Zambia Daily Mail, Friday, August 7, 2009; converted at ZMK 5060/US\$ (average US\$ BOZ selling price; 2009 BOZ Annual Report).

# 5. Reasons for low government revenue from the mining sector in Tanzania and Zambia

## 5.1 The importance of fiscal design

### 5.1.1 Government mining revenue and ownership interest

In order to make some comparisons between Tanzania and Zambia in this area, it is useful to take a look at the general composition of tax revenue in some of the benchmarking countries we studied previously. Botswana and Chile have had mineral tax revenue at or above the level expected from what could be called a principle of effective benefit-sharing between the country and the companies.<sup>42</sup>

A first observation is that in both countries there was either a dominant or significant contribution to the overall mining revenue from government ownership (either direct or indirect). In the case of Chile, the contribution from the state-owned company, Corporacion Nacional del Cobre (CODELCO), to total mining tax revenue was as high as 76 per cent from 1998 to 2011 (and above 70 per cent for most of the 1990s and most likely before as well). In recent years, with the large increase in the copper price (in particular from 2003/4), the contribution of taxation (other than from CODELCO) increased somewhat, but still the lowest level of government ownership contribution to government mining revenue was 56 per cent in 2007 (58 per cent in 2011).

The case of Chile is interesting because there has been a development from around the mid-1990s, where the state (through CODELCO) produced more or less the same amount as the privately-owned copper mines, to the current situation where the private mines produce and export more than double the state-owned mines. Over the period, investment levels by the state-owned mining company have been similar to the private mines, varying between USD 1-2 billion/year. But the fiscal contribution from the state-owned company (that admittedly is the largest copper producer in the world, one of the world's lowest cost producers of copper and the largest company in Chile) has consistently been dominant in the total mining tax revenue collected.

For Botswana it has not been possible for this paper to unbundle mining revenue by ownership and tax, but many experts share the view that the government ownership through De Beers Botswana Mining Company (DEBSWANA) (as well as on a global level in De Beers) has been fundamental in securing the very high total mining revenue realised consistently over consecutive decades. It is also noteworthy that prior to the joint ventures with De Beers in the main diamond mines through DEBSWANA, Botswana collected a lower share of profits from most of the incipient mines in the country.

The above emphasis on the importance of government ownership, managed in a strictly commercial manner, is interesting considering the widespread tendency to write off the importance and efficiency of this approach, in particular in mining. (Many would perhaps question this in particular for earlier periods in the case of CODELCO, but in the period we are focusing on it is close to the actual situation.)

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<sup>42</sup> The rule of thumb established was that the mineral contribution to domestic revenue should be equal to or above the mineral contribution to GDP. It was argued that in times of high real mineral prices, the revenue ratio should be growing in relation to the GDP ratio, due to increased levels of rent.

To assess in detail the efficiency of this approach in these country cases for the period of focus here, it would be necessary to study the investments made and the costs in more detail, as all have implied either direct or indirect fully-owned, co-owned or joint venture operations of mines. The added challenge is related to the well-known poor performance of many state-owned enterprises in SSA and other parts of the developing world, often following processes of nationalisation.

Both Zambia and Tanzania have had their fair share of such experiences as well, and on average it is fair to say that they have not turned out to be efficient instruments to secure substantial economic rent. This pattern is, of course, closely associated with a period of development in SSA where the economy was largely nationalised. Zambia and Tanzania had the respective processes of the Mulungushi and the Arusha declarations, which followed initial years of transition after independence in 1964 and 1961 respectively.

This historic experience failed, as we know, to bring about sustained economic development. It was dominated by, on average, low global mineral prices after the mid-1970s and a state-led development model, in a situation with small internal markets and large barriers to trade both inside Africa and with the outside. The extent to which this means that any future government ownership interest will be impossible to manage effectively in SSA is another question. The model is certainly predominant in several major petroleum countries in the region, but the experience here is also largely negative in terms of efficiency and resource revenue management. It is uncertain to what extent this also applies to the effectiveness of the ownership to collect resource rent. It would seem that the problem is particularly related to what happens with the ownership revenues after they are collected. Often there is inefficient transfer of funds to the treasury and fiscal management.

The government in Zambia still has in their regulation and legislation the ambition to participate with minority free or carried ownership interests in the mining sector. In Zambia the government retains a share of between 5-20 per cent carried ownership interests in several of the privatised mines, managed through the state-dominated holding company, ZCCM-IH. As was to be expected, however, the payment of dividends in most years since privatisation has been rather limited. This fits into an overall emerging impression that minority government ownership interests in the mining sector are not an efficient way to secure and collect a significant share of the economic rent and profits. (Ghana is another example where the government has free carried minority ownership interests in several of the mines, but where this has led to very limited government revenue.)

Each country has to consider carefully the combined mix of ownership interest (direct and/or indirect), together with the tax regime. It may well be the case that the risk of political interference and capture is so high that ownership interests become impossible to manage. If so, an efficient tax regime with direct transfer of funds, and the strongest checks and balances possible, may be preferable. However in other cases the conclusion will be different, and it may or should change over time.

For Tanzania and Zambia it seems the experience with government ownership interest in mining is fairly negative at the moment. It does not make much sense to continue with minority ownership interests managed through quasi commercial entities without the financial, technical and managerial capacity required. It would be preferable now to focus on a more effective tax regime with a high level of investment in technical and financial audit and control capacity to protect the tax base and collect higher tax from the mining sector. The other option would be to build up the state ownership interest in a forceful manner with a long-term perspective. It may be that this can become more feasible some time in the future.

### **5.1.2 Government mining revenue and tax regime**

For both countries examined, there has been some progress over the period 1998-2011, and in particular in recent years, in terms of the amount of mining revenue collected. There seems to be a clear correlation between higher mineral prices and the mining revenue collected, as could be expected. At the same time, however, we also see from our benchmarking exercise that the forgone mining revenue has increased both in absolute and relative terms for both countries, in particular from 2004/5 onwards.

When examining the mining tax payments for Zambia and Tanzania, one of the most striking findings is that profit-based tax payments have been virtually non-existent in recent years, and, in fact, since privatisation in the late 1990s and early 2000s.<sup>43</sup> Considering that such taxes normally are expected to contribute a significant revenue component in the design and negotiation of the fiscal regime, this is a considerable problem and one major reason why the government mining revenue was low. In fiscal simulations carried out to project tax revenue to the state in mining and in petroleum, it is a recurrent assumption that profit-related taxes such as the CIT and profit oil (or gas) should deliver a significant share of total government revenue from the resource production and export.

The approach to corporate income tax (CIT) and the rates have been similar in Zambia and Tanzania, with respective rates of 25 per cent and 30 per cent for most the period. This is similar to the rates in most other mining countries, where typically the rate is between 20-30 per cent (Conrad 2012). From 2008 to date, Zambia also introduced an excess profit tax (the variable income tax), which has not produced much revenue either.<sup>44</sup> Tanzania currently does not have such a tax instrument. This instrument however faces the same basic challenges as CIT in effectively securing a reasonable government share, and has so far not been very effective in the two countries covered in detail here.

It is instead the gross-based taxes that have contributed by far the most to the mining revenue collected in the two countries. For Tanzania, in the two financial years covered in detail at the company level through the EITI reports, it is PAYE (from 20-35 per cent), royalty (from 22-28 per cent) and VAT (28 per cent for 2009/10) that dominate in the total mining tax payments, followed by contributions to pension funds and indirect payments such as import and excise duty. On balance it is clear that employee-based taxes have contributed either more or the same as corporate-based taxes in the overall mining tax payments received in the two countries. Considering that mining uses a non-renewable resource with considerable economic rent, this situation is clearly unsustainable and represents ineffective revenue-sharing between the companies and the government.

Overall there is a need to introduce a tax mechanism that can progressively capture an increasing share of the growing economic rent at higher prices and inherent profit levels. So far, however, such mechanisms have not been common in mining fiscal regimes, and even less so in terms of their actual ability to capture significant revenue or share of the rent. In contrast, such mechanisms seem to have been more successful in petroleum, often through production-sharing terms related to profit oil or gas, where the split increases in the government's favour as the amount of profit goes up.

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<sup>43</sup> With the notable exception of Kansanshi mine in Zambia, which has quite consistently made significant corporate tax payments since it started operations under the current ownership in 2006.

<sup>44</sup> As Conrad (2012, p. 22) has pointed out: 'the basic problem with the methodology is that it is an average, but excess profits if they are to be defined at all, are not averages but total values. Thus, it is possible for one mine to have a large net present value, a large capital cost, and a large margin on some measure of profits to sales while another mine has a high ratio (greater than .08 in this case) while having negative returns to true equity (or even be technically bankrupt)'. As Conrad suggest there are alternatives to the standard resource rent taxes (such as the variable income tax introduced in Zambia), including a variable royalty as he proposes, or the windfall tax as it was originally designed in Zambia in 2007/8.

Such an approach was built into the original windfall tax when it was introduced in Zambia in April 2008, with rates of 25, 50 and 75 per cent at different price levels (above 200 per cent of the average cash costs of the mines according to the companies' financial reports), but was never implemented as originally intended. If properly designed and implemented, including indexing and deductibility, this type of tax instrument would have had many advantages over regular profit-based taxes, both in terms of securing increasing shares of government take, while at the same time providing a stronger incentive for action to reduce costs at the mine level. This latter point is an element of this tax type that is overlooked by most agencies and tax analysts. Some countries have progressive royalties. The efficiency and potential of the windfall tax was proven during the short period from April-September 2008, when it is estimated that USD 240-260 million in tax liabilities was generated while allowing normal investment returns and levels of profit (Lundstøl 2009).<sup>45</sup>

Finally, most mining countries have multiple exemption regimes. These often vary between companies, depending on when the development agreements were signed. These are, however, coming under increased scrutiny, and are an important part of what erodes the tax base, resulting in low mining tax payments in many countries. There is really no good reason to grant extensive exemption regimes to extractive industries in most developing countries. Investment and production decisions of the companies are mainly based on the quality of the mineral resource, and the overall conditions and ability to produce and export the refined mineral. However there is both perception and practice of the necessity for these exemptions, which together uphold their continuation despite little or no firm evidence of their effectiveness in securing investment and production, and the known effect they have on undermining the tax base. Some exceptions could perhaps be made for exploration, but that is often mixed into the production tax accounts (unless there is very efficient ring-fencing that is enforced). In Tanzania there is a movement to remove tax exemptions in mining, although so far it has met a lot of resistance and there have been cases of reversals for several mines.

In conclusion, with regards to the tax regime, we find the key elements to emphasise are: i) the royalty rate should in general be adjusted upwards, but some difference kept by mineral and based on gross values; ii) progressive resource tax (ideally one that encourages cost-saving and secures a high share of the rent); iii) reference or norm price (ideally in legislation and contracts and agreements, and applicable for both gross and profit taxes); iv) ring-fencing (ideally pit by pit); v) linear capital depreciation; vi) treat hedging as separate business activity; vii) consider higher withholding tax (in particular related to transactions with secrecy jurisdictions); and viii) normalisation of indirect taxes and levies (with strict boundaries for exceptions that are controlled).

## **5.2 The importance of technical capacity**

### ***5.2.1 Technical audit (control of production volume, grade and by-products)***

To establish a correct tax base on which to apply an efficient tax regime, it is essential to ensure that the export-sale volume, grade and by-products all reflect the real situation. If there is substantial variation in any of these parameters it can in effect easily remove any potential for profit and substantially reduce the base for other taxes and fees in the country of production.

Pilot audits covering the three largest copper mines in Zambia, carried out in 2008/9, showed several instances of under-reporting of volumes, grade and by-products. It is widely recognised that there is very limited capacity and ability to carry out regular minimum

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<sup>45</sup> After September 2008 it did not apply again for most of that financial year due to the global financial crisis and the temporary collapse in the copper price.

technical audits at mine, smelting and border sites to verify what is being sold out of the country. This is further aggravated by the rather complicated value chain involved in large-scale copper mining, where often some refining and/or smelting is carried out by separate or associated companies, and important elements of the potential tax base can be transferred or eroded in terms of distinct tax treatment.

In Tanzania, the introduction of the Gold Audit Program (and later TMAA) as a requirement in the Mining Act from the late 1990s, implemented from the early 2000s, meant that the country on average seems to have had more control on production volumes, grade and by-products. Another issue is how efficiently findings from the technical audits were followed up in the tax audits and tax assessments, of which there are still many outstanding up to this day in Tanzania.<sup>46</sup>

Another example from Zambia is the importance of cobalt as a by-product in many of the copper mines over time. It is widely recognised that Zambia is the second largest producer of cobalt in the world after DRC. Still, the officially reported volumes of cobalt are fairly moderate, and the associated value of this by-product even more so. A calculation undertaken in 2007 (Lundstøl 2007) based on visits to several of the major copper mines and smelters in Zambia showed that the estimated value of production most likely was above USD 1 billion, compared to a much lower official number, and the margins were extremely high (thereby in principle opening up the possibility of significant taxation and revenue if it had been covered and enforced). At that time there was no specific consideration of taxation of cobalt in the legislation, even though the international price of cobalt was growing to a historically very high real level. Control, or even awareness, of this issue was virtually non-existent in Zambia at the time, as was shown in dialogue with high-level officials in the Ministry of Finance as well as Energy and Minerals (specific consideration was introduced from April 2008 in the new Mining Act, but has in effect never worked efficiently).

### **5.2.2 Tax audit (control of price and costs)**

From the Tanzania case, and specifically looking at the 2008/9 financial year covered in the EITI report, what emerges is that the main problem seems to be related to the treatment of costs in tax accounts for each large-scale mine. There seemed to be a weak relationship between cost levels and implicit margins of the mines, and how much they actually paid in tax both overall and for corporate income tax only. Another related observation was the very large difference in output efficiency per employee at the five largest mines, ranging from 99 to 468 troy ounces of gold export. Looking at the ore grade and throughput of some of the mines involved, it is difficult to explain such differences unless one includes exploration effort and costs, as it seems clear that these are often mixed together in the tax accounts to reduce the tax base.

Analysis from earlier years by TMAA and others has also shown problems on the revenue side, despite the improved control and audit of production and prices (Curtis and Lissu 2008). Our preliminary assessment, however, is that the establishment of the TMAA in particular seems to have addressed the revenue-reporting problem for tax purposes, at least for now.

Further analysis would be necessary to really understand the cost treatment challenge in the mining sector, and possible detailed solutions or changes that would work best in terms of the tax regime and regulations. This would need to look into the different elements in more detail, as well as scrutinise the actual capital expenditure and investment of each mine and production site. This is not the purpose here, and it will have to be left for future research.

<sup>46</sup>

According to IMF (2011) there were outstanding tax assessments for 38 financial years in the large-scale mining sector in Tanzania. Considering the limited number of such mines and companies, this means that there is a 5-7 year lag in the closing of tax assessments, including actual settlements. Norway is currently supporting Tanzania in closing this gap.

It seems clear that there is a technical problem related to the treatment of costs, and that this affects the ability to tax the large-scale mines in Tanzania effectively, and most likely in Zambia as well. In Zambia the non-existent technical audit capacity, combined with until 2008 only 2-3 tax auditors covering the entire mining sector (small and large), makes it obvious that the tax base was routinely reduced, most probably through both legal and illegal measures. This, combined with a weak tax regime and widespread exemptions, produced low mining revenue. It also provided a fertile ground for corruption, as the pay-off was very high both for capital interests and others.

### **5.3 The predominance of political will and vested interests**

Political will and interference have played a significant role in most mining and petroleum countries. The question is perhaps more the degree of influence, how it has been expressed, and whether it can be assessed in practice and in a useful comparative perspective.

In a recent article about Tanzania, it is argued that 'Informal political processes as much as formal regulatory frameworks were responsible for creating a favorable window for investment in mining, but that this window now appears to be closed. A combination of nationalist-populist politics, short term election pressures, and decentralised rent management currently increases both risks and cost in the gold sector, and we believe it unlikely that increases in foreign direct investment will be sustained' (Cooksey and Kelsall 2011, p. 58).

The authors make a fairly strong case for how a consensus was built for reforms in the mining sector in modern times, in particular with the preparations leading up to the favourable mining investment framework found in the 1998 Mining Act. Overall, of course, the period from the mid-1980s to the late 1990s was marked by a dramatic turnaround in economic development strategy and policy from the government, where Tanzania went from a state-led economy to a fairly open and market-driven economy in many areas (Nord et al. 2009).

The public discourse on the mining sector in Tanzania, as in most other major developing countries with a major mining sector, has become polarised and very politicised. One major weakness in this argument, however, is that it does not really relate to the fundamental question of whether Tanzania is getting a reasonable level of tax revenue from the mining sector. This is perhaps to be expected in a broader political economy contribution. It does, however, weaken some of the relevance of the assessments, as well as the main argument with regards to unfair treatment of the mining companies. It also fails to fully recognise that many of the problems described for Tanzania are common in most major mining developing countries.

These risks are routinely factored into the decision-making of any major mining company before it decides whether to enter into a country or not, as well as, but less so, on whether to operate beyond certain thresholds after the investment has been made. In particular, in today's global mining scenario, with relatively limited new major gold resources, it is the quality of the resource potential that is the defining factor, as long as other conditions are above certain levels (PwC 2011). Tanzania does not perform particularly badly in relative terms with regards to its enabling framework for large-scale mining, according to recent global comparison.

To what extent does the political economy factor explain the low level of tax collection from the mining sector in Tanzania? There is a considerable history of state rent-seeking, corruption and deal-making in the mining sector. This has been shown, in particular, through the grand corruption cases of the Alex Stewart gold audit case, involving several key public

officials, and Meremeta Ltd. buying gold and mining to finance military procurement (Cooksey and Kelsall 2011, boxes 9 and 10). Similarly to the case in Zambia, awarding MDAs and, in particular, their fiscal conditions, are also thought to have been linked to bribery and corruption (Curtis and Lissu 2008).

There are also major problems linked to the mining cadaster, and the management of potential and old licence rights for exploration and production in Tanzania. Somehow a small number of individuals or companies seem to control very large areas of potentially very valuable mining area, without the financial or technical capacity to explore or utilise this territory. This should be linked to the fact that Tanzania has one of the highest upside potentials in relative terms when it comes to expanding exploration efforts in the country. If we assume similar resource richness as in Chile, which is not unlikely from a geological point of view, it should be able to increase its production and export value by more than 100 times per square kilometer of land.

It is thought that this historical trajectory and the current situation are to a large extent due to rent-seeking and corruption (Cooksey and Kelsall 2011, p. 68-9). The Tanzania Revenue Authority is often mentioned in relation to inconsistent tax assessments that could be in conflict with the fiscal terms of the MDAs, and tax disputes tend to drag on for many years without any effective resolution. Work in this area has however progressed in recent times, and on-going efforts to clear the backlog of tax audits and assessments are promising.

How a country selects to tackle: i) the choice of contractual or concessionary regime; ii) management of exemptions and incentives; and iii) ownership interest, tax policy and enforcement, is in practice often closely linked to political economy and the priorities of different interest groups and individuals. It is not by coincidence, for example, that developing countries, and in particular countries in SSA, choose to enter into some of the most complex contracts or agreements, even when they more often than not have a clear disadvantage due to their low level of information and capacity to negotiate these effectively to their benefit.

The management of exemptions and incentives is an area where the expression of political power and interests can be seen. This is very clear in mining globally, in both Zambia and Tanzania, and in the history of tax exemptions and incentives in general. More often than not, decisions are related to individual companies and people, rather than any strategic sector, economic or infant industry argument. Up to recent times, donors have been reinforcing this logic through their projects by project financing and lobbying. This is in addition to an overall emphasis on foreign direct investment, and an investment climate that has not been able to rank what is important effectively (Fjeldstad and Heggstad 2011).

How countries and governments relate to the ownership interest, tax policy and enforcement is also affected by politics. Ownership interest choice in mining since the 1990s has tended to be focused on minority direct or indirect interest, most often free or carried. The experience of Zambia and some other mining developing countries with respect to this has been negative. The payment of dividends has been on average symbolic, and the influence of government ownership interests has usually been weak or non-existent. In addition, in the case of Zambia the ZCCM-IH, which manages these interests on behalf of the government, has been a massive loss-making venture for the government. This was due, first, to the enormous write-off of debt that was eventually transferred to the government through ZCCM-IH, and settled by the Ministry of Finance and Planning. Secondly, it was related to no transfer of even small dividend payments to the Treasury. All in all, a bad deal for the Zambian government, although recent sales of valuable ownership interests in the largest new greenfield copper mine developed in Africa in recent times (Lumwana to Barrick in 2011) could represent an opportunity to change this.

## 6. Some lessons for poor but resource-rich developing countries

### 6.1 National wealth can be reduced through large-scale mineral extraction

The trend for Sub Saharan Africa overall, and for Zambia specifically, is clear from 2004/5 to recent years, as there have been either negative or low rates of national adjusted savings in contrast to the trend in most of Asia and Latin America. This implies a reduction in the national wealth. For non-renewable resources such as minerals, this reflects a situation whereby a physical asset with an inherent value has been inefficiently extracted from below the ground and transformed into a financial asset (from the point of view of the ultimate owner of the resource, the people or the country).

Two basic things need to change to reverse this trend. The first is to capture a larger share of the resource rent, and the second is to invest that share more effectively to increase the national wealth. In this paper we have focused on the first challenge, in particular by examining the cases of Zambia and Tanzania in terms of collecting tax revenue from the mining sector, and estimating their foregone levels of tax revenue due to ineffective benefit-sharing mechanisms. In this exercise we have provided a simple method or rule of thumb to estimate what could represent effective benefit-sharing in mining countries.

### 6.2 Mining tax regimes worldwide often do not secure effective benefit-sharing

The country and its people can normally secure a high share of the realised resource rent and profit associated with the extraction and sale of a non-renewable resource such as minerals either through government taxation and ownership interest. Since the 1990s, most attention has been on the former, and a series of reforms have brought about fairly uniform tax regimes and approaches across the world, often closely linked with privatisation processes. In many countries, including Zambia and Tanzania, this secured much-needed investment, technology transfer and increased production and export. It has become apparent, however, that the prevailing mining tax regimes have not secured effective benefit-sharing, particularly since the onset of what could represent a fourth mining super cycle.

The degree of this shortfall in tax revenue collection from the mining sector is shown in this paper through the benchmarking exercise. This showed that, in 2011 alone, if Zambia had achieved a similar ratio between its mining contribution to GDP and its contribution to domestic revenue as was achieved in Chile, it could have increased its tax revenue from mining by more than USD 1 billion. This increase would have been more than the total net development aid to the country for that year. This estimate is actually lower than what the Deputy Minister of Finance in Zambia says that his country loses every year in tax evasion and avoidance, mainly in the mining sector.

It is likely that, globally, the amount of rent captured by the average host country of mining resources is less than half what is achieved from petroleum. Recent simulations for Tanzania (using available company financial statements and the existing tax regime) confirm that the average effective tax rate for mining is less than half that of petroleum in signed production-sharing agreements. Similar findings have been documented in Australia. The recent global overview by the IMF of fiscal regimes in extractive industries confirms this, but offers no comprehensive answers or fundamental reasons for the difference (IMF 2012).

It is also striking that the two foremost success stories among mining countries globally over the last two decades, Chile and Botswana, have both relied heavily on government ownership interest to rise above the average performance of other countries. For Chile,

ownership interest explained as much as 76 per cent of total government take 1998-2011. This was despite comparable levels of investment by the state company CODELCO and private mines over the period and previously, and despite significantly higher production and export levels from the private mines. Unfortunately the decades following independence in SSA and many other developing countries do not give great hope to the possibility of replicating this experience, and the potential downside and costs are high.

It is clear that there are more similarities than differences in the mining tax regimes across the seven countries covered here, as well as some others included in available overviews (PwC 2010). Some trends that seem to be present in the more successful countries (including changes in recent years and improved revenue collection in relative terms) include: a) higher royalty rates (from 5-10 per cent and increasingly based on gross); b) progressive profit-based taxes; c) longer capital depreciation (linear, mine or life of asset); and d) higher withholding taxes. While all of these elements potentially seem to contribute to collecting more tax from the mining sector, they have not proven to be sufficient so far to turn around the level of collection in any country to a satisfactory degree in terms of overall benefit-sharing.

### **6.3 Transition towards improved regimes for managing tax revenue from the mining sector**

A recent report of mining tax payments (PwC 2010), and analysis of the first EITI reports for Zambia and Tanzania, show the risk of a reduction in adjusted national wealth and low mining revenue associated with large-scale mining production and sale. PwC (2010) shows, in a global sample of the major mining companies and key countries, that employee- or people-related taxes accounted for 55 per cent of total mining taxes, whereas 27 per cent were profit taxes and 18 per cent product-related taxes (e.g. royalty, VAT). The EITI reports showed that in Tanzania employee-related taxes accounted for around 50 per cent of total mining taxes in 2008/9, and slightly below 30 per cent in 2009/10. Zambia also shows a high dependence on employee taxes, and in particular personal income tax (PAYE). Considering that in order to count PAYE as a contribution by mining, it must be assumed that workers would not be paying PAYE if they were employed in another sector (in effect that the workers would be unemployed and the economic opportunity cost of labour would be zero), the above trends questions even more the level of tax revenue collected by the countries from the mining sector.

From the above evidence, there can be little doubt that an orderly negotiated transition towards improved uniform mining tax regimes are needed in several poor but resource-rich developing countries. These processes have already started in many major mining countries over the last few years, although most cannot be described as orderly and negotiated. Zambia was one of the first to start a renegotiation process, but this turned into more of a unilateral change, and Tanzania has only partially renegotiated one or two elements in some mining development agreements.

It would seem that most of the transitions towards improved mining tax regimes have yielded some positive results. This can be observed by simple calculations and comparisons, for example in the case of Zambia particularly in recent years. It would seem, however, from our benchmarking exercise and the rule of thumb presented in this paper, that effective benefit-sharing has not yet been achieved in either Zambia or Tanzania, or in the majority of poor mining but resource-rich developing countries.

Based on the analysis and discussion in this paper, we propose a four-pronged approach. This can be taken through negotiated transitions aiming to reach similar fiscal terms ideally for all mining companies over time, as well as direct administrative action. It can be applicable for all countries within a reasonable time frame.

1. **Strengthen the fiscal regime for mining.** Key elements for the context of tax assessment can be categorised as either tax type or methodological base. In the latter category we find actions such as: a) ring-fencing (by mine or ideally by pit); b) capital depreciation (slower); c) hedging in separate tax base; and d) norm/reference pricing. In the area of tax type and specification, we find: a) higher royalty (5-10 per cent and gross based); b) profit-based tax; c) progressive royalty or windfall tax (based on a proxy for investment coverage or indexed costs combined with price level); and d) higher withholding tax (in particular for secrecy jurisdiction transfers). The outlook for a renewed significant government ownership interest approach seems perhaps unrealistic at the moment. Principles to consider in possible engagement include to: avoid as much as possible free or carried minority interest positions (on average they tend to deliver little revenue); manage commercially and professionally; ensure expedient fiscal transfers by rule and law; maintain competition; and audit independent boards independently.
2. **Include a transparency guarantee in all agreements.** A major problem and reason why countries have low collection of mining revenue is related to the erosion of the tax base through both legal and illegal tax practices. Often it is difficult or almost impossible to stop this and/or to prove that something illegal or against the rules of laws of taxation has taken place. Major tax reassessments to raise the correct tax from the taxpayer are hard to enforce. Today this can be dealt with through voluntary agreements, or in some rare cases automatic exchange of information, where the onus is on government institutions to provide documentation.

The suggested transparency guarantee would fundamentally move the responsibility more towards where it belongs, namely with the company involved in the exploration and production based on a licence issued by the country. It could provide a guarantee to the resource owner that, in exchange for access to the resource, the company would provide full access to all relevant documents related to resource production and sales, all the way to the 'real' origin or receiver. This would enable the establishment of a correct tax base. An example of such a guarantee has been drafted for possible inclusion in production-sharing agreements for the upcoming 4<sup>th</sup> national licensing round for offshore petroleum in Tanzania (Årsnes and Eriksen 2012). This guarantee could be included in different types of policy, legislation, contracts and agreements, through different means and with different time perspectives.

3. **Specialised technical capacity to audit resource production and export.** Surprisingly, many governments of major mining developing countries have little or no capacity or funding to carry out basic technical audits of production and export data, in order to verify independently the production and export data provided by the mining companies. As a result, there is widespread under-reporting both of the main products and the by-products (which can often be extremely valuable per unit due to high prices and low additional costs of production, e.g. cobalt in copper production in Zambia). Unless the government can get on top of this area, it does not really matter how 'optimal' the tax regime is. Typically this area of focus will deal mainly with the revenue side (covering production and sales volumes, and sales price as well in some cases, such as the Tanzania Mineral Audit Agency). It can, however, also provide important specialised technical data and analysis on the cost side, due to in-depth knowledge related to production and export, and overall industry insights.
4. **Specialised technical capacity in resource tax administration.** There is a need to install a dedicated and specialised capacity in resource tax administration. This can ensure that the tax base is maintained, correct tax assessments are carried out and that tax assessments are enforced. Considering the distribution of human and institutional resources found in developed country multinational corporations, this is an area of great unexplored potential and high return to investment. It is also necessary to invest some time and funding in assessing and improving policy, legislation, regulations and

administrative practices and guidance, as well as basic infrastructure and software to work on complicated financial accounts and statements.

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